SPECIAL ISSUE: Complete Guide to the I-Way

SEPTEMBER 1994

PC Computing

Doing Business on the Internet and Beyond

How to get the **e-mail** edge, instantly spot key **trends,** and find world-class **freebies.**

Ten hours per day.
One hundred and thirty words per minute.

Fifteen hours today.
Sixty-five overnight packages. Tonight.

Two hundred and sixty-five hours this month.
Twenty-eight days out of college.

End-User Rebates. MultiSync 2V $25, MultiSync 3V $40*

Introducing the MultiSync® Value Series Monitors. The affordable solution for those who make your business run.

They're the people you count on to get the job done. From secretaries to shipping, they need all the help you can give them. Luckily, the 15" (13.8" diagonal viewable area) MultiSync® 3V and the new 14" (13" diagonal viewable area) MultiSync® 2V give them the bright, sharp images you'd expect from an NEC MultiSync monitor. You also get MPR II compliance, Mac and PC compatibility, high refresh rates and resolutions up to 1024 x 768 NI, all with a 3-year limited warranty. It's more than you'd expect at such a great price. But then again, you're probably used to getting the most for your money. Questions? Call 1-800-NEC-INFO. Or, for information via fax, call 1-800-366-0476 and request document #153501 and #143201. **The easiest monitors to live with for hours and hours: Ours.** NEC

MultiSync 2V

Circle 218 on reader service card.

Optional cable adapter, required for Macintosh connection, available free from NEC. MultiSync and FastFacts are registered trademarks of NEC Technologies, Inc. The Energy Star emblem does not represent EPA endorsement of any product or service. © 1994 NEC Technologies, Inc.

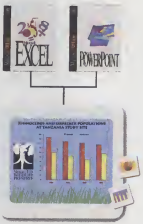
*See your local NEC dealer for details or call NEC FastFacts™ at 1-800-366-0476 and request document #24 for a copy of the rebate redemption form.

IN THE MICROSOFT OFFI
DON'T JUST COHABIT, THEY FOR

You might say we simply borrowed the idea from nature. Programs that live in the same place should work together.

Consider what you have to do in a single week. Letters. Memos. Reports. Spreadsheets. Charts. Graphs. Presentations.

Wouldn't it be great if there were a product that could help you pull it all together?



Create powerful presentations easily with information from different programs. Suddenly, you're a whiz presenter.

In a nutshell, that's the whole idea behind the Microsoft* Office. Now all your programs can work together like one.

Thanks to our intuitive OfficeLinks tools, it's easier than ever to share text, data and graphics seamlessly between our best-selling programs.

What's this really mean?

Simply, you'll be able to get more done. With a lot less effort.

Say you're working on your sales report. You'll probably start by writing in Microsoft Word.

*Support for Microsoft Office is no-charge, however, normal telephone company charges. Microsoft Excel, Word, the PowerPoint presentation graphics program, the Microsoft and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are Microsoft Corporation.

CE, SOFTWARE PROGRAMS
M MEANINGFUL RELATIONSHIPS.

Then you click to open your Microsoft Access® database and call up your sales data. By client. By vendor. By salesperson. By region. By month.

But why stop there?

You can easily send that data to a Microsoft Excel spreadsheet in just a click of a button, analyze it, turn it into a dramatic chart, and drop it all back into your Word document.

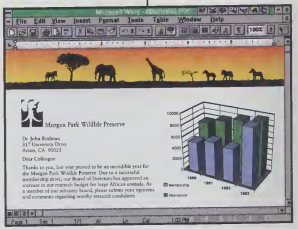
It's like one big technological swap fest. The end benefit being, that now you can spend more time concentrating on your work, instead of on your software.

Naturally, you'll want to share your handiwork with the regional managers.

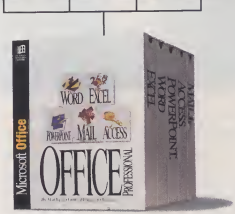
Just a couple of clicks later, you've created personalized letters for each one of them from within Microsoft Word.

Brilliant.

Now for the finishing touch. Click a button and transform everything into an eye-popping PowerPoint® presentation. Call it a "career-enhancing" move.



It's easy to update or manage text, data and graphics in one document with the latest object linking and embedding technology (OLE 2.0). Just click where you need to work and the tools you need are right there.



And while we're on the subject of relationships, we should mention the Microsoft Office is the only product of its kind that offers you unlimited product support with no service charge.*

Clearly, the Microsoft Office with OfficeLinks marks a quantum shift in what software enables you to achieve. And it's a clear indication of where the future is heading.

To find out the rest of the story (a small sample of which we've covered here), visit your retailer or call (800) 894-6642, Department VAC, for your Office Information Kit.

With the Microsoft Office, you'll not only improve the relationship between your programs, the same will go for you and your computer.

Microsoft Office

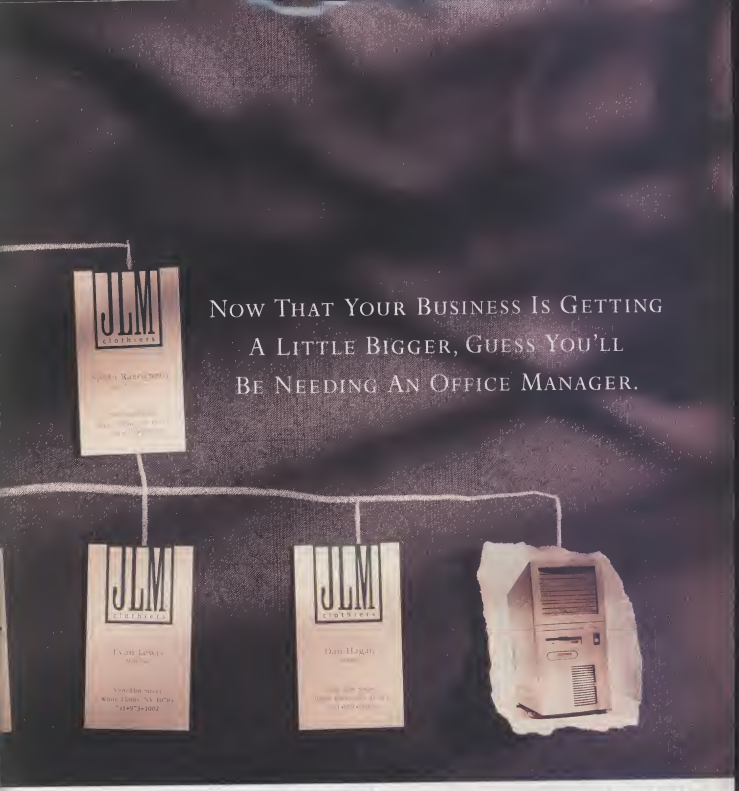
pply. Microsoft support services are subject to Microsoft's then-current prices, terms, and conditions, which are subject to change without notice. © 1994 Microsoft Corporation. All rights reserved. Microsoft Office Professional, shown here, includes Access database management system and a Mail workstation license (server and software must be acquired separately). In the 50 United States, call (800) 894-6642, Dept. VAC. For information only. In Canada, call (800) 563-9048, outside the U.S. and or hard of hearing, can reach Microsoft text telephone (TT/TDD) services by calling (800) 892-5234 in the United States or (905) 568-9641 in Canada. Microsoft, PowerPoint, Microsoft Access and the Windows logo are registered trademarks of

These days, all it takes is a little success to overload your business. The more you demand of your computers, the slower things can get. Well, that's because PCs are made to be PCs. And at this point, what you really need is a server — the most efficient way to get your PCs working together.

So we'd like to introduce you to the Compaq ProSignia VS. Now, for the price of a desktop, you can get a real, industrial-strength server made by the company who knows the technology best. (Compaq is recognized as the world leader in servers.*)

Unlike a PC, the ProSignia VS is specifically designed for the job of powering a computer network in small- to medium-sized businesses. It's optimized for high-speed file transfers, to eliminate the finger-tapping during everyday tasks, like calling up a customer record to take an order. It also expands easily to

© 1994 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. ProSignia VS is a trademark and PaqFax is a service mark of Compaq Computer Corporation. SmartStart and covered by a one year warranty.



NOW THAT YOUR BUSINESS IS GETTING A LITTLE BIGGER, GUESS YOU'LL BE NEEDING AN OFFICE MANAGER.

provide vast, centralized storage as your business grows larger.

And while most servers are complicated, the ProSignia VS can make your life easier. Our optional CD-based SmartStart simplifies the whole process of setting up a reliable system. And Insight Manager (also an option) keeps an eye on key parts, pinpointing problems *before* they can disrupt operations.

Of course, the ProSignia VS also provides the security of Compaq's three-year on-site warranty** and 24-hour support line.

To find out how you can give your company more agility as it grows, visit an authorized Compaq reseller. If you'd like more information, or if you'd like the name of your nearest reseller, call us at 1-800-638-8258, ext. 450. We can show you the best kind of office manager: One that works as hard as you do.

COMPAQ

Insight Manager are registered trademarks of Compaq Computer Corporation. *Source: International Data Corporation, 1993. **Certain restrictions and exclusions may apply. Monitors, battery packs and certain options are

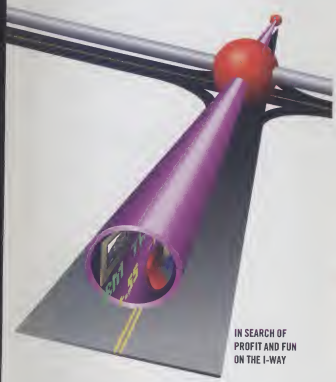
Circle 115 on reader service card.

PC Computing SEPTEMBER 1994 VOLUME 7 NUMBER 9

COVER STORY

Going I-Way?

How do you succeed in business in the 1990s? Two words: Information Superhighway. To help you master the road, our Special Report tells you what to look for, where to find it, and how to get there. **120**



IN SEARCH OF PROFIT AND FUN ON THE I-WAY

The Net Result Welcome to the Internet, the I-Way's main artery. Here's how to navigate its rich global network of databases. **122**

Online Fever CompuServe, Prodigy, and America Online all offer news, financial data, e-mail, and more. Which is easiest to use? **140**

Dialing for Data Bulletin board services provide a treasure trove of information in hundreds of specialty niches for profit and fun. **166**

Viewpoints "Are we there yet?" Backseat drivers Ed Bott, page **49,** Gil Schwartz, page **55,** and Penn Jillette, page **352,** offer their two cents.

ROUNDUP

Super Systems

Faster than PowerPCs and priced to sell, 90MHz Pentium systems are one of the year's hottest hardware attractions. Should you buy one? You bet. **174**

MINDFOOD

Virus, They Wrote

Meet your worst enemies. They shrug it off when their viruses destroy your data. Want to avoid them? Just ask. We did. And they told all. **206**

FAR LEFT PHOTOGRAPH BY STAN MUSILEK. LEFT PHOTOGRAPH BY AMY GUIP

THE CHICAGO FIRE: *Our preview of Windows 4.0 sparked heat and ignited some flames.* **23**

GENIUS OR JERK: *What kind of warped mind would write a virus?* **206**

WINWORD FREEBIE: *Get the features that Microsoft left out.* **218**

New!

Talking Heads Videoconferencing from Intel and AT&T works—sometimes. **58**

61 Xerox's 4900 Color Laser Printer

62 Toshiba's Portégé T3600CT

64 TI's microMarc Inkjet

66 Caere's DmniScan

68 HP's Vectra VL2 4/100 vs. Polywell's Poly DX4-100C

72 Umax's PowerLook vs. Microtek's ScanMaker III

76 IBM's ThinkPad 755C and HP's 200LX

79 Logitech's SoundMan Wave and Seagate's Elite 9

83 Aldus's FreeHand 4.0

84 Manhattan Analytics' FundPro 3.0 vs. Reality's Reuters Money Network for Quicken Users

86 Datastorm's Procomm Plus 2.0 for Windows

88 Scan/US

90 Serif's PagePlus 3.0

92 Caere's DmniPage Professional vs. Calera's WordScan Plus

94 American Small Business Computers' DesignCAD 2D Windows 7.0

96 Symantec's Act 2.0

98 Lotus's ScreenCam 1.1 for Windows and Helix's Multimedia Cloaking

105 Hayes Microcomputer's LANstep 2.0

106 Farallon Computing's EtherWave AUI Transceiver and Tut Systems' Silver Streak

106 Ventana Media's Internet Membership Kit

108 Logbook: HP's LaserJet 4 Plus and Arabesque's Ecco Professional

Pulse Microsoft Exchange takes on Lotus Notes; Chicago sings; lowest CD-ROM prices; CommerceNet promotes business on the Net; Radar; and more! **30**

Help

Fed Up with Windows? While you wait for Windows 4.0, here's how to patch 3.1. **214**

218 **Windows:** Workgroups.

224 **DDS:** Recursive switches.

230 **Applications:** Remote control for PCs and TVs.

238 **Networking:** Pick an OS.

242 **Toolkit:** CD player apps.

252 **How It Works:** Voice recognition explained.

254 **F1:** Modem secrets.

263 **Direct to You:** Ink jet printers and Spec Watch.

250 **PC Contact:** Free files.

Technolust Data, data everywhere, and not a thought to think. Don't drown in information, these tools won't let you sink. **346**

COLUMNS

MAIL: *By phone, fax, Net, and post.* **23**

PAUL SOMERSON: *Damn the killer prudes! Our new five-star rating system helps you choose just the right product.* **47**

ED BOTT: *Would you believe a 12-step program for Net newbies? How about some do's and don'ts?* **49**

JOHN C. DVORAK: *It's déjà vu all over again: Multimedia will succumb to the Commodore 64 syndrome.* **53**

GIL SCHWARTZ: *On the road with Al Gore, beatnik-in-chief of the Information Superhighway.* **55**

CD-RON WHITE: *Magazines in the round, and other circular diversions.* **349**

PENN JILLETTE: *The Net is just speech. Let's fight to keep it free.* **352**

TOP: PHOTOGRAPH BY ARNOLD TIDSLJO BOTTOM PHOTOGRAPH BY GEOFFREY NELSON

ONLY

MOTHER

NATURE

PACKS

MORE

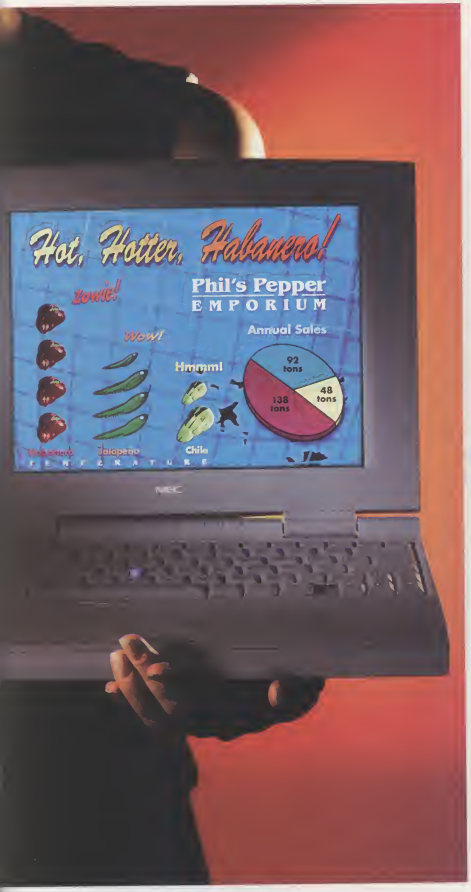
POWER

INTO SUCH

A SMALL

PACKAGE.

Versa is a trademark of NEC Technologies, Inc. The Intel Inside logo is a registered trademark of Intel Corp. All other trademarks are the property of their respective owners. The Energy Star emblem does not represent EPA endorsement of any product or service. * *Versa 5 monochrome model © 1994 NEC Technologies, Inc. NEC GSA #GS00K93AGS5241*



Here's a hot little number guaranteed to set your imagination on fire. Presenting the Versa™ S notebook computer from NEC.

VERSA=VERSATILITY

Perhaps the most powerful notebook pound-for-pound (actually, starting at about 4 lbs.) on earth, thanks to the availability of an i486™ DX2/50 processor with on-board local bus video, up to 12 MB RAM and 260 MB hard disk storage. The Versa S is, in dimension, no larger than a piece of notebook paper. But that didn't stop us from packing it with an unusually long list of standard features. Choose from a brilliant 9.5" color TFT, enhanced color DSTN or monochrome LCD display. It features a large keyboard with an accurate*

SurePoint™ pointing device, PCMCIA Type III capabilities, serial, parallel, SVGA and keyboard/mouse ports. Yet, it folds to a svelte 1.4" inches. For more

information, call 1-800-NEC-VERSA or visit an authorized dealer. The Versa S notebook. It's got the kind of powerful kick that would impress even Mother Nature.

SEE, HEAR AND FEEL THE DIFFERENCE.

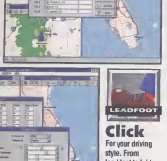
NEC

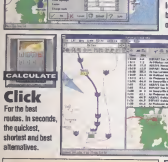
Circle 182 on reader service card.

Take Your PC On the Road

Click
To start your journey. Choose from over 120,000 cities.

Click
For your destination time and place. Make up to four stops along the way.





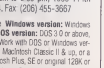
Click
For your driving pleasure. From lead foot to laid back, freeways or county roads.

Click
For the best routes. In seconds, the quickest, shortest and best alternatives.

Go!
Your personal driving guide. Maps and directions to guide you in your journey.

AUTOMAP®

Call today to order
1-800-440-MAPS
or visit your local software store



Automap Road Atlas (DOS or Win or Mac) $99.95 **$59.95**
Automap Road Atlas (CD Version–Win) $99.95 **$59.95**
Automap Road Atlas Upgrades (DOS or Win) ...$39.95 **$29.95**
Automap Destination Europe (add-on) $49.95 **$39.95**

Payment by VISA, MasterCard, or Check. Add $5.50 shipping and handling. WA residents add 8.2%. CA residents add 8.5%.

Automap Inc. Monday–Friday 8:30 am to 5:00 pm, 1309 114th Ave. SE, Suite 110, Bellevue, WA 98004. Fax: (206) 455-3667

Requirements: Hard drive with 5½ MB free. **Windows version:** Windows 3.0 or above in standard or enhanced mode. **DOS version:** DOS 3.0 or above, 640K RAM. **Destination Series add-ons:** Work with DOS or Windows versions of Automap Road Atlas. **Mac version:** MacIntosh Classic II & up, or a Powerbook 140 & up. Does not run on Macintosh Plus, SE or original 128K or 512K MacIntosh. Superdrive. System 6.0.7 or above, System 7 friendly.

© Copyright 1988-93, NextBase Ltd. Automap is a registered trademark of NextBase Ltd.

Circle 117 on reader service card.

PC Computing

VICE PRESIDENT, EDITORIAL DIRECTOR
Paul Somerson

EDITOR-IN-CHIEF Jon Zilber
EDITOR Bill Roberts

FEATURES
FEATURES EDITOR Sebastian Rupley
SENIOR EDITORS Howard Baldwin, Elizabeth Longsworth, Wendy Taylor
ASSOCIATE EDITORS Liesl La Grange, Chris Sandlund

NEWS AND REVIEWS
REVIEWS EDITOR Raphael Needleman
SENIOR EDITORS Matthew J. Lake, Shyamala Reddy
ASSOCIATE EDITORS Kyla K. Carlson, Richard Schwerin
ASSISTANT EDITOR James Oliver Cury

HELP
SENIOR HELP EDITOR John Montgomery
HELP EDITOR Yael Li-Ron

CONTRIBUTING EDITORS
SENIOR CONTRIBUTING EDITORS Ed Bott, Ron White
CONTRIBUTING EDITORS Vincent Chen, John C. Dvorak, Charles Fleischer, Preston Gralla, Robert L. Hummel, Marty Jerome, Penn Jillette, Woody Leonhard, Brian Livingston, Jeff Prosise, Winn L. Rosch, Gil Schwartz

LABS AND TECHNICAL
SENIOR TECHNICAL EDITOR/LAB DIRECTOR Adam Meyerson
ASSOCIATE TECHNICAL EDITORS Scott Naylor, John Taschek
USABILITY LAB MANAGER George Hackman, Jr.
PROJECT LEADER Robert Bayley
INVENTORY COORDINATOR Ibrahim Gul
LAB SUPPORT TECHNICIAN Lydia M. Karlowicz

EDITORIAL PRODUCTION
MANAGING EDITOR Debra McDonald
ASSISTANT MANAGING EDITOR Lori A. Uzzo
ELECTRONIC PUBLISHING MANAGER Mark C. Li
SENIOR COPY EDITORS Kim Austin, Elisa M. Welch
COPY EDITOR Joe Rossi
PRODUCTION EDITOR Laura Watt

ART AND DESIGN
ART DIRECTOR Michael Yapp
ASSOCIATE ART DIRECTOR Allyson Appen
SENIOR DESIGNER Kate Godfrey
SENIOR TECHNICAL ILLUSTRATOR Timothy Edward Downs
ART ASSOCIATE Peggy Smith
DESIGN CONSULTANT Anthony Kosner

VICE PRESIDENT, PUBLISHER J. Samuel Huey

MARKETING AND SALES
ASSOCIATE PUBLISHER Nancy Newman
DIRECTOR OF MARKETING Michael Wiener
GENERAL BUSINESS MANAGER Anne H. Ashmead
SUBSCRIPTION DIRECTOR Charles Mast
SINGLE-COPY SALES AND MARKETING DIRECTOR James E. Gerth
SALES DEVELOPMENT MANAGER Tamar Haspel
PROMOTION AND EVENTS MANAGER Julie McGill
MARKETING INFORMATION SPECIALIST Kimberly Black
EVENTS COORDINATOR Caryl Dearling

ADMINISTRATIVE
EXECUTIVE ASSISTANT TO THE VP, PUBLISHER Leta C. Fisher
EXECUTIVE EDITORIAL ASSISTANT Patti McCaffrey
ASSOCIATE PUBLISHER'S ASSISTANT Melissa Eckholm
RECEPTIONIST Melanie McCullough

PRODUCTION
PRODUCTION DIRECTOR Carlos Lugo
PRODUCTION MANAGER Dennis Fitzgerald
ASSISTANT PRODUCTION MANAGER Monique L. Risso

How to Contact the Editors Address editorial feedback to 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax us at (415) 578-7029; contact us via the Internet (76000.214@compuserve.com) or CompuServe (76000,21); or log on to PC Contact to post a public message (see page 250 for log-on instructions). PC Computing is under no obligation to review unsolicited products. All unsolicited submissions become the property of PC Computing. If you want to make a submission to PC Computing, contact one of the following editors—**Features: Sebastian Rupley or Howard Baldwin; News and Reviews: Raphael Needleman; Help: John Montgomery.** If you buy a product advertised in PC Computing, are dissatisfied, and can't resolve the problem, write (please do not call) Leta C. Fisher, Executive Assistant to the VP, Publisher, at the above address. Include copies of all correspondence.

Subscription inquiries/Change of Address For subscription service questions, address changes, or how to order: call toll-free (800) 365-2770 in the United States and Canada, or (303) 447-9330 for all other countries; or write to PC Computing, P.O. Box 58229, Boulder, CO 80322-8229. The subscription rate is $24.97 for one year (12 issues). Canada and all other countries require an additional $16 for postage. For back issues (subject to availability), send a check or money order for $7 ($8 outside the United States) to Back Issues Department, Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322-3131.

PC Computing on CD-ROM PC Computing is available as part of Computer Select, a CD-ROM published by Computer Library. Each monthly issue of Computer Select contains the full text of the most recent year's issues and more than 60 other leading computer industry publications. For subscription information, call Computer Library at (800) 827-7889, extension 708.

Serious Savings on Toys!

A Quantex Multimedia Package Priced to Make You Smile

The cost of computer toys can really add up. That's why, at Quantex, we're committed to giving you the most features at the best prices. Multimedia is no exception. Quantex has put together two multimedia packages that will meet your needs and excite your senses. And these toys are no kid's stuff. Take a look at what we've got for you.

Blast off to **MPC Level 2** standards with our double-spin **CD-ROM** drive and **Sound Blaster™** compatible 16-bit stereo sound card with stereo speakers. Run wild with one of these CD-ROM bundles: the first system includes **Compton's Interactive Encyclopedia™, Microsoft® Dinosaurs,** and **Microsoft Works**, while the other features **Compton's Interactive Encyclopedia, Dictionary of the Living World, Compton's Family Choice, Mayo Clinic Family Health Book,** and the **Kodak® Photo CD!**

Plus, go for the gold with **Microsoft Money** and **Microsoft Entertainment Pack**. Zip along the communication highway with our built-in high-speed fax/modems. Access over 17,000 databases with **CompuServe®, Prodigy®,** and **America On-Line**. And the **Pentium™ OverDrive™ Ready** ZIF socket makes future processor upgradeability a cinch.

Take advantage of this multi-faceted multimedia package from Quantex. Give us a call now. You'll discover we may sell toys, but we don't fool around.

Accept only the Smart Caviar
WESTERN DIGITAL

intel inside

VISA MasterCard DISCOVER

Multimedia Systems

Q486SX/33VM-1 $1349

- Intel486™ SX33 Processor
- 4MB RAM
- 340MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- VESA Bus Graphics Accelerator w/ 1MB
- 14" 1024x768 NI Color Monitor
- 5-Bay desktop case
- 101-Key enhanced keyboard & Mouse
- 9600/2400 Baud Fax/Modem w/software
- Double-spin multisession CD-ROM drive
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 3 CD Discs: Compton's Interactive Encyclopedia, MS-Dinosaurs & MS-Works
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line

Q486DX2/50VM-1	**$1499**
Q486DX2/66VM-1	**$1549**
Q486DX4/100VM-1	**$1899**

QP5/60PM-1 $2199

- Intel Pentium™ Processor
- 8MB RAM, 256KB Fast Cache
- 540MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-bit PCI Bus Graphics Engine w/ 1MB
- PCI Local Bus Enhanced IDE controller
- 15" Digital Color NI Monitor
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- 14,400 Baud Fax/Modem w/software
- Double-spin multisession CD-ROM drive
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 5 CD Discs: Compton's Interactive Encyclopedia, Compton's Family Choice, Dictonary of the Living World, Mayo Clinic Family Health Book, and Kodak Photo CD
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line

PCI SYSTEM

Q486DX2/66PM-1	**$1999**
QP5/66PM-1	**$2349**
QP5/90PM-1	**$2549**

QUANTEX Microsystems, Inc.

1-800-787-8686

[illegible] prepaid checks, [illegible] accepted. On-Site [illegible] (RMA) number and must be [illegible] are non refundable. Prices and [illegible] photography The Intel Inside [illegible] shown herein may be the property of [illegible] orders from government agencies, universities, and Fortune 1000 [illegible] le areas. All returned items must have a Return Merchandise [illegible] freight is not included with any Money-Back Guarantees, shipping [illegible] notice. Quantex Microsystems cannot be responsible for errors in [illegible] trademarks of Intel Corporation. Some of the names or trade- [illegible] Baby picture from Tony Stone Images.

Actual 720 x 720 dpi output.

720 dpi printing requires special coated paper (12.5¢ MSRP/sheet). EPSON and EPSON Stylus are registered trademarks of SEIKO EPSON CORP. ©1994 EPSON AMERICA, INC.,

EPSON STYLUS TAKES COLOR PRINTING WHERE NO INK JET HAS GONE BEFORE.

Introducing the High Definition EPSON Stylus COLOR, the world's only 720 x 720 dpi color ink jet.

The color will astound you. It's near photographic, more dazzling than you've ever seen from a personal ink jet. At 720 x 720 dpi, the High Definition EPSON Stylus COLOR prints over 5 times more dots per square inch than the comparably priced HP DeskJet 560C. "Nobody believed that this level of quality could get to this price point," says industry analyst Rob Auster of BIS Strategic Decisions Inc.

BEST OF BYTE COMPETITION

But there's more to it than stunning color. Our unique driver lets you make on-screen color adjustments, and increases your productivity by returning you to your application faster.

The EPSON Stylus COLOR also prints unsurpassed black & white text. And the same technology that makes our color so amazing drives our High Definition monochrome ink jets. For more information on the ink jets that are miles ahead of the rest, visit your EPSON dealer or call 1-800-BUY-EPSON.

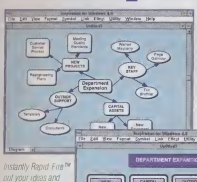
NARROW CARRIAGE MONOCHROME

WIDE CARRIAGE MONOCHROME

EPSON

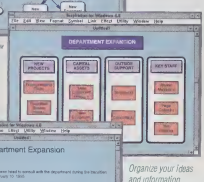
20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, call 800-BUY-EPSON (800-289-3776). In Canada, call 800-GO-EPSON. For Latin America, 305-265-0092.

Instantly Visualize Concepts...*Get Clear*



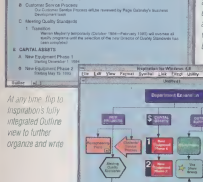
Instantly Rapid Fire™ out your ideas and see your thinking take form

Getting started is often the most difficult part of clarifying an idea or developing a plan or project. The next time you begin to work use Inspiration®—the real-time idea development tool for quickly clarifying and organizing your thoughts.



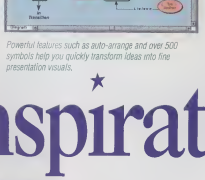
Organize your ideas and information easily into tree charts and presentation visuals in the Diagram view

Inspiration's intelligent diagram view lets you instantly enter your ideas.



At any time, flip to Inspiration's fully integrated Outline view to further organize and write

Inspiration also features a powerful, fully integrated outliner to provide additional organizing and writing capabilities.



Powerful features such as auto-arrange and over 500 symbols help you quickly transform ideas into fine presentation visuals.

Visualize and Get Clear. Call today for a free demo.

Inspiration®

Call (800)877-4292
For your
FREE DEMO
& Idea Book

Inspiration Software®, Inc. 2920 SW Dolph Court Suite 3 Portland, OR 97219
503.245.9011 TEL 503.246.4292 FAX

Circle 151 on reader service card.

PC Computing

ZIFF-DAVIS PUBLISHING COMPANY
CHAIRMAN Eric Hippeau

BUSINESS MEDIA GROUP
PRESIDENT Ronni Sonnenberg
GROUP VICE PRESIDENT Claude P. Sheer
GROUP VICE PRESIDENT Jeff Ballowe
VICE PRESIDENT, MAGAZINE NETWORKS Joseph Gillespie
VICE PRESIDENT, CENTRAL ADVERTISING SALES Bob Bader
VICE PRESIDENT, EDITOR-IN-CHIEF PC MAGAZINE Michael Miller
VICE PRESIDENT, EDITORIAL DIRECTOR PC COMPUTING Paul Somerson
VICE PRESIDENT, GROUP PUBLISHER Al DiGuido
VICE PRESIDENT, PUBLISHER PC COMPUTING J. Samuel Huey
VICE PRESIDENT, PUBLISHER PC MAGAZINE Jim Stafford
VICE PRESIDENT, PUBLISHER PC WEEK Don Byrnes
DIRECTOR OF CORPORATE MARKETING Susan Delman
DIRECTOR OF PUBLIC RELATIONS Brenda Wheeler
DIRECTOR OF TRAINING Ellen Atkinson
DIRECTOR OF ZIFF-DAVIS PREFERRED CUSTOMER (ZDPC) PROGRAM Celia Canfield
SALES DEVELOPMENT MANAGER, ZIFF-DAVIS MAGAZINE NETWORKS/ZDPC Jeff Bruce
CO-DIRECTORS OF ZD BENCHMARK OPERATION Bill Catchings, Mark L. Van Name
DIRECTOR OF ZD LABS Robert W. Kane

ZIFF-DAVIS PUBLISHING COMPANY
PRESIDENT, CONSUMER MEDIA GROUP J. Scott Briggs
PRESIDENT, COMPUTER INTELLIGENCE/INFOCORP Bob Brown
PRESIDENT, INFORMATION ACCESS COMPANY Robert Howells
PRESIDENT, INTERNATIONAL MEDIA GROUP J.B. Holston III
PRESIDENT, ZD EXPOS Bill Lohse
PRESIDENT, ZIFF-DAVIS INTERACTIVE Michael Kolowich
PRESIDENT, ZIFF TECHNOLOGY GROUP Ken Jeffers
SENIOR VICE PRESIDENT, CIRCULATION Baird Davis
SENIOR VICE PRESIDENT Rachel Greenfield
VICE PRESIDENT, ASSISTANT TO THE CHAIRMAN Tom McGrade
VICE PRESIDENT, CIRCULATION SERVICES James F. Ramaley
VICE PRESIDENT, CONTROLLER Howard Scklotnik
VICE PRESIDENT, CREATIVE SERVICES Herbert Stern
VICE PRESIDENT, GENERAL MANAGER Bruce W. Bourne
VICE PRESIDENT, HUMAN RESOURCES Rayna Brown
VICE PRESIDENT, PRODUCTION Roger Herrmann
VICE PRESIDENT, RESEARCH Rolf M. Wulfsberg
VICE PRESIDENT, STRATEGIC PLANNING Robert Ziff
VICE PRESIDENT, TECHNOLOGY Bill Machrone
CHIEF INFORMATION OFFICER Wellington Y. Chiu
INTERNAL MARKETING CONSULTANT Paul H. Chook
EDITORIAL DIRECTOR Lewis D'Vorkin
EXECUTIVE DIRECTOR, INFORMATION SYSTEMS Owen Weekley
EXECUTIVE DIRECTOR, MARKETING SERVICES Jim Manning
PRODUCTION DIRECTOR Walter J. Terlecki
DIRECTOR OF LICENSING Jean Lamensdorf
DIRECTOR OF PUBLIC RELATIONS Gregory Jarboe

ZIFF COMMUNICATIONS COMPANY
CHAIRMAN AND CEO Eric Hippeau
SENIOR VICE PRESIDENT & CHIEF FINANCIAL OFFICER Bruce R. Barnes
SENIOR VICE PRESIDENT Steven C. Feinman
VICE PRESIDENT, GENERAL COUNSEL AND SECRETARY J. Malcolm Morris
VICE PRESIDENT, BUSINESS MANAGER T.L. Thompson
VICE PRESIDENT, CONTROLLER AND TREASURER Timothy J. Mitchell

CHAIRMAN EMERITUS William B. Ziff, Jr.

PC Computing is an independent journal, not affiliated in any way with IBM Corporation. PC Computing is a registered trademark of Ziff-Davis Publishing Company, L.P. The following are trademarks of Ziff-Davis Publishing Company, L.P.: American Computing, Fast Facts, The Magazine for Business Computing Experts, PC Contact, PC Sources, Perfect 10, Personal Computing, Pro Tips, Software Secrets, and The Ultimate PC. Entire contents copyright © 1994 by Ziff-Davis Publishing Company, L.P. All rights reserved.

The best way to organize people, places and things.

Get more done in less time and manage your contacts and activities more efficiently. Introducing WordPerfect® InfoCentral,™ the intelligent information manager.

Using iConnect™ technology, InfoCentral connects information about people, places, things and events. It then displays the information in an easy-to-read outline that lets you see it from any perspective.

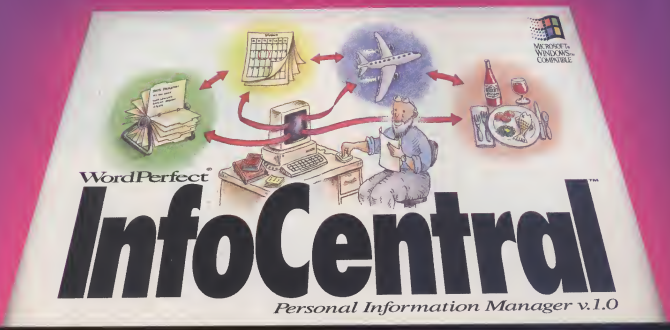
Information from any Windows application can be connected to items within InfoCentral. You can even manage your contacts and "to-do" lists using InfoCentral's calendar and address views.

InfoCentral also includes information bases (iBases™) on consumer goods, computer products, travel, and wines.

InfoCentral. It's one of the many products you'll find on Main Street, the new family of easy-to-use software from WordPerfect Corporation.

Call 1-800-526-5208 or see your local retailer for more information.

WordPerfect®
Main Street.™
Bringing the best home.



WordPerfect is a registered trademark of WordPerfect Corporation. Main Street and InfoCentral are trademarks of WordPerfect Corporation. Microsoft, Windows, and Windows are trademarks or registered trademarks of their respective companies.
© Corporation worldwide. All other brand and product names are trademarks or registered trademarks of their respective companies.

Fast start . . . No limits!

Parad

Paradox for Windows - [WorldOptics Order Entry System]

File Edit View Form Record Properties Tools Window Help

Customer

Contact Name : Loren Nisley

Telephone: +44-71-123456

Company Name: The Camera Shop

WORLD OPTICS

Order

Order No	Date	Total Amount
2199	1-Jul-94	2,723.00
2286	12-Jul-94	1,235.23
2350	3-Aug-94	1,913.55

Status:
- In Stock
- Back Ordered
- Discontinued

Ship via: Two day

Ordered by: Telephone

PO No.: M1209

Camera

Qty	Unit Price	Total Price
2	1,195.00	2,390.00

Filters

Qty	Unit Price	Total Price
2	19.00	38.00

Video Camera

Qty	Unit Price	Total Price
1	1,565.00	1,565.00

Print Invoice

Upload Orders

Microsoft Word - FETTERS.DOC

File Edit View Table Record Properties Window Help

Andrew H. Brown
Executive Consolidated Enterprises
12345 East Seventeenth Street
Santa Ana, CA 92705

WORLD OPTICS

Dear Mr. Brown,

We appreciate your giving our valued customers an opportunity to test your new product. Furthermore, we are very pleased that you will drop ship the filters directly to our customers, thus saving us the shipping and handling.

Here are the names and addresses so that you can fulfill the orders:

CUSTOMER	Company Name	Address	City	Postal Code
1	The Camera Shop	1022 High Street	London, England	SW1 1HQ
2	Vitrum	36 rue du Temple	Paris, France	75004
3	Cavagnari & Co.	Avenida Paulista, 1000	Sao Paulo, Brazil	13035

Thank you for your cooperation. We look forward to working with you in the future.

Sincerely,

▲ *Paradox for Windows has superior integration with Perfect Office and Microsoft Office applications. Thanks to OLE 2.0, you can place a "live" Paradox table into a Microsoft Word or WordPerfect document and edit the data in place. (Access 2.0 cannot do that.)*

February 1994 — November 1993 — June 1994

◀ *Paradox for Windows is the most award-winning Windows database on the market with over 20 major industry awards for excellence.*

Copyright © 1994 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. Offer good in U.S. and Canada only. All prices in U.S. dollars. Dealer prices may vary. BI 7402

OX

NEW VERSION 5.0

Paradox WORLD TOUR

Coming to a city near you!

For more information dial Fast Fax 1-800-408-0001

New version is easier than ever

The new Paradox® 5.0 for Windows is here, and suddenly managing your business data and building database applications just got faster and easier. You'll be amazed at what you can do with the new tools that let you start fast and do more. For example, 13 new Interactive Coaches quickly teach you how to accomplish any task. The Coaches even let you work with your own "live" data, so you complete your work as you learn. Then there are the on-line Experts™ that guide you step-by-step in creating professional-looking forms, reports, and mailing labels. Even your largest data management tasks will be completed in record time.

Office integration outshines Access

Full client and server support for OLE 2.0 and DDE make Paradox the best database for use with other applications including Perfect Office and Microsoft Office. For example, you can place a "live" Paradox table in a Word document, edit the table in place, and your changes are automatically updated *(Access can't do this)*. And Paradox gives you record level locking, that provides enhanced productivity in multiuser environments. *(Access locks up your whole page!)*

Want to increase your workgroup productivity? Paradox's built-in Workgroup Desktop and new Mail Enablement make it easy to publish and subscribe the latest data, using your existing network or e-mail system. This makes it simple to get weekly or monthly updates like sales and expense information.

Comparison Facts

End-user Features	Paradox 5.0	Access 2.0
Built-in computer-based training	✓	
Experts/Wizards to guide you step-by-step	✓	✓
Integrated graphics	✓	
Built-in workgroup and mail capabilities	✓	
Quick Filters without query process	✓	
Power-user/Client/server Features		
OLE 2.0 client and server support	✓	
Compatibility with applications from previous version	✓	
Visual Data Model Designer	✓	
Transparent connectivity and scalability with database aliases	✓	
Record level locking	✓	
Full range of data types, including Time, Graphic and Autoincrement	✓	
Graphical Integrated Development Environment (IDE)	✓	
ODBC-compliant	✓	✓
Dedicated high-performance native SQL drivers	✓	

More speed, developer enhancements, and Client/Server connectivity

New Paradox 5.0 for Windows has been tuned to give you better performance. It stores and retrieves data faster, and delivers answers to queries with more speed than ever before.

And Paradox 5.0 for Windows has kept developers in mind too. There's a new Integrated Development Environment and more than 300 new Methods and Properties help you develop ObjectPAL™ Windows applications faster. Plus, with Borland's new high-performance native SQL links, Paradox is ready when you are to upsize your applications to the Client/Server environment.

Get started fast with Paradox 5.0 for Windows' ease of use and you'll quickly discover it's the one database with the depth and performance you want to stay with.

Special competitive upgrade offer!

$199.95

90-day money-back guarantee

See your dealer, or call today!

1-800-336-6464, ext. 9052

In Canada call 1-800-461-3327

Borland
The Upsizing Company

Circle 261 on reader service card.

THE STAR WARS YOU'VE NEVER SEEN...
COMING TO A COMPUTER SCREEN
NEAR YOU THIS SUMMER.

Behind every great film is a screen saver. Star Wars Screen Entertainment brings your favorite screen savers and more...the concepts, original art, animation, sounds, even a special message from George Lucas.
Now Star Wars is on your computer — Screen Entertainment has arrived.

See the Cantina, space battles, hyperspace and more.

"BONUS: A SPECIAL MESSAGE FROM GEORGE LUCAS ABOUT THE NEXT STAR WARS TRILOGY"

"Stress-tested product concepts with interactivity and Alex Ross."

Using an actual 3-panel character biographies, blueprints, the complete script.

STAR WARS
SCREEN ENTERTAINMENT

For Windows and Macintosh • At your favorite software retailer, or call 1-800-STARWARS

Circle 140 on reader service card.

Coming Soon

WORK SMARTER IN WINDOWS Tired of Windows' weird quirks? Our fourth annual Windows Superguide found Windows 3.1's weak spots. Then we found how to keep it humming through your daily work. Don't miss our usability tune-up—or our performance enhancements.

NEW PRINTING SOLUTIONS Vendors are lining up with a slew of new technologies to help you make your points in color. We cut through the technobabble to determine where these printers best fit in your organization.

TOP BUSINESS CDs From WordPerfect to News Electronics' Taxi, CD-ROMs mean business. Ron White checks out the top CD-based applications and databases. With bonus files and multimedia wizardry, these CDs will help make you more productive.

CUTTING EDGE CD-ROM DRIVES We've always been aware of the limitations of CD-ROMs. The latest crop of CD-ROM drives addresses our concerns. They spin faster. They let you take CDs on the road. And finally, you can press your own disks. But will they help you work better?

ALSO NEXT MONTH

Monitor Flicker F1 explains why scan frequencies, flicker, and interlacing are important when you purchase a video monitor.

The New Standard Master the peculiarities of Windows for Workgroups 3.11—the operating system that's pre-installed on most new PCs. In Help.

New! Check out the best-performing portable we've ever seen and the latest Notes development tools.

PC Computing

VICE PRESIDENT, PUBLISHER J. Samuel Huey

SALES MANAGEMENT

ASSOCIATE PUBLISHER Nancy Newman
(415) 578-7076

ASSOCIATE PUBLISHER/EAST COAST Sloan Seymour
(212) 503-4830

WESTERN ADVERTISING DIRECTOR William P. Howard
(415) 578-7570

ADVERTISING COORDINATOR Melissa Casey
(415) 578-7031

ADMINISTRATIVE ASSISTANT Karen Maske
(415) 578-7017

SALES COORDINATOR Francie More

SALES ASSISTANTS Kerry Barlas, Jennifer Criddle, Erving Dockery, Richard McNees, Priscilla Ng, Pam Norris, Bennett Schneider, Tom Wan, Jennifer Williams, Alice Yeh

ADVERTISING SALES OFFICES

NEW ENGLAND
Joyce Rossell, District Manager, 10 Presidents Landing, Medford, MA 02155, (617) 393-3306
Debra Donovan, Account Representative (415) 578-7068

MID-ATLANTIC
John R. DeSpirito, District Representative, One Park Ave., New York, NY 10016, (212) 503-4907
Monica Sembler, Senior Account Representative (415) 578-7067

MIDWEST
Craig Westcott, District Manager, 150 North Wacker Dr., Suite 2500, Chicago, IL 60606, (312) 214-7333
John Zaterka, Account Representative (415) 578-7065

SOUTHEAST
Thalia Karakitsios, District Manager, 3405 Piedmont Rd. NE, Suite 460, Atlanta, GA 30305, (404) 814-8960

SOUTH CENTRAL
Peter Muller, District Manager, 5956 Sherry Ln., Suite 625, Dallas, TX 75225, (214) 360-5755
George Carney, Account Representative (415) 578-7056

SOUTHWEST
David Lynn, District Manager, 18301 Von Karman Ave., Suite 330, Irvine, CA 92715, (714) 852-5912
Michael J. King, District Manager, 11766 Wilshire Blvd., Suite 1550, Los Angeles, CA 90025, (310) 268-1360
Stacey Levy, Account Representative (415) 578-7066

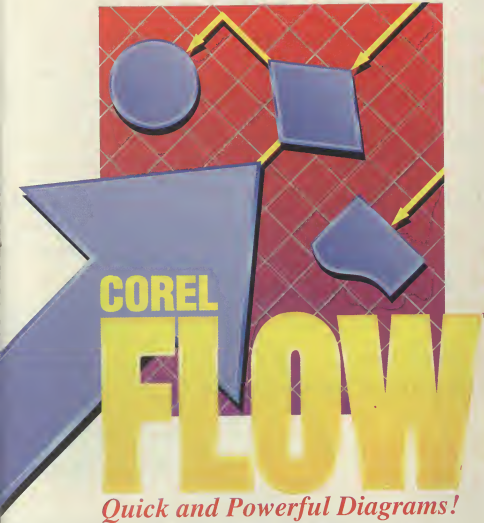
SAN FRANCISCO BAY AREA/PACIFIC NORTHWEST
Kelly Worrall, District Representative, 950 Tower Ln., 19th Floor, Foster City, CA 94404, (415) 578-7061
Gwyn Jones, Account Representative (415) 578-7070

SAN JOSE
William B. Wise, District Manager (415) 578-7052
Phil Kramer, District Manager, 950 Tower Ln., 19th Floor, Foster City, CA 94404, (415) 578-7073
Anne Dewling, Senior Account Representative (415) 578-7058

MARKETPLACE SALES OFFICE
Ziff-Davis Publishing Company, One Park Ave., 3rd Floor, New York, NY 10016, (800) 825-4237

Permission and Reprints Material in this publication may not be reproduced in any form without permission. Written requests for permission should be addressed to Chantal Lavelanet, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. For information on reprints in quantities of 500 or more, contact Carol Peters at (212) 503-5447, or the above address. Printed in the U.S.A. Canadian GST registration number is R123669673.

The Audit Bureau



Quick and Powerful Diagrams!

CorelFLOW is the fast, easy way to organize and communicate your ideas with flowcharts, diagrams, schematics and more!

Incredible value!

- **2,000** Symbols
- **1,000** Clipart Images
- **1,000** Corel Photos on CD-ROM
- **100** TrueType Fonts

Easy to use!

- "Drag and drop" drawing
- Automatic shape connectors
- Direct text and line editing
- Customizable workspace

Powerful!

- OLE 2.0 support
- Customizable Smart Symbol Libraries
- Application and diagram linking
- Access multiple Smart Symbol Libraries
- Automatic resizing of symbols to fit text
- Flexible object manipulation
- Built-in spellchecker

$99*
Sugg. List Price

Dealer may sell for less.
*US$ plus applicable taxes

Call today!

1-800-591-0010

Enter the CorelDRAW $1,000,000 World Contest and win! (September to March)
To receive a faxed copy of the rules and an entry form please call:
1-613-728-0826 ext. 3080, Document # 1004.
To leave a message please dial: 1-613-728-0826 ext. 1609

Circle 180 on reader service card.

THE NEW PREMMIA™ GX. It merely starts with Intel's Pentium™ microprocessor, in two speeds, the fastest and very, very fast. In other words, 100 MHz or 90 MHz.

From there, AST engineers raised the bar, and the new Premmia screamed right by the Compaq Deskpro and HP Vectra to 112 million WinMarks* of graphics performance. With dual 100 MHz CPUs and the fastest cache system ever, just imagine what you could do.

You could actually do more than two things at once. That is what your boss has been asking for all along, right? Suppose, for instance, you are designing a suspension bridge. You could rework the center span drawings while

IT'S THE FASTEST PERSONAL COMPUTER THERE IS, GIVE OR TAKE A NANOSECOND.

And less time fiddling with your computer setup. Whatever you're doing, security features will help protect your most sensitive data and corporate secrets. Who knows? You might be able to accomplish ten hours of number crunching in five, and catch an early commuter train home in time to see your Little Leaguer whack one out of the park.

Of course, the Premmia comes with expert backup, starting with a 3-year limited warranty.

Our network of over 6,000 resellers will help you with your purchase and stick with you afterwards, too. Every day, 24 hours a day.

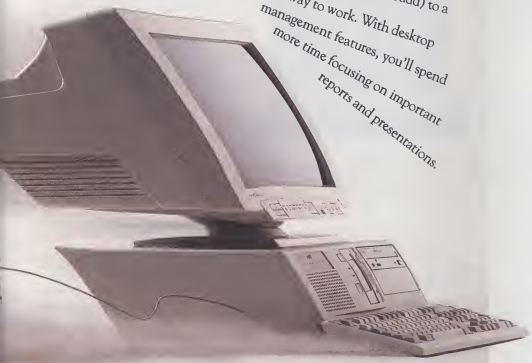
© 1994 AST Research, Inc. All rights reserved. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo, Premmia and "You'll Like the Way We Work" are trademarks of AST Research, Inc. The Intel trademarks or registered trademarks of their respective owners. *WinMarks 3.1 (4.0 score: 41 million). **CY93 unit volume shipments of AST and AST manufactured brands (International Data Corp.). The information included in

calculating load and stress numbers at the same time.

That's not all. The Premmia GX is affordable like a personal computer. But with a whole array of innovative features, it actually performs like a true workstation.

All the newest 32-bit operating systems are supported. Integrated Ethernet is already built right in. And there's no faster way to connect peripherals like a hard drive or a scanner than with the GX's integrated FastSCSI-2 controller.

Still, we're not simply talking speed for speed's sake. It all adds up (quite quickly, we might add) to a better way to work. With desktop management features, you'll spend more time focusing on important reports and presentations.



our own extra responsive telephone support group is here to help. Would you expect anything less from the world's fifth largest personal computer manufacturer?**

Well, then, is this the kind of personal computer (or call it a workstation) you'd like on your desk?

In a blink. A snap. A flash. A heartbeat. A nanosecond. So why don't you hit speed dial and call us at 800-876-4AST.

YOU'LL LIKE THE WAY WE WORK™

Premmia GX

Pentium 90 & 100 MHz, dual processor capable, OverDrive™ Ready. PCI and EISA. 256KB Synchronous Burst Mode cache. 64-bit PCI local bus graphics card. 2MB VRAM upgradable to 4MB. Supports up to 1280 x 1024 x 16.7 million colors non-interlaced. Integrated PCI local bus FastSCSI-2 controller. Integrated Ethernet. Type III PCMCIA capability. Plug-n-play capable. DMI support. Energy managed.

Premmia MX

Pentium 60 MHz, IntelDX4/100 and 486DX2/66, OverDrive Ready. PCI and ISA. Pentium models: 256KB cache. 486 models: 256KB cache on hard drive models, 64KB or 256KB options on base models. 64-bit PCI local bus graphics card. 2MB VRAM upgradable to 4MB. Supports up to 1280 x 1024 x 16.7 million colors non-interlaced. Type III PCMCIA capability. Plug-n-play capable. DMI support. Energy Star.

AST® COMPUTER

Inside logo is a registered trademark and OverDrive is a trademark of Intel Corporation. All other product or service names mentioned herein may be accurate as of July 1, 1994, but is subject to change without notice.

THE COMPAQ CONTURA AERO AT $999.

Take Two, They're Small.

CONTURA AERO FEATURES

ONLY 3.5 LBS

486SX/25 PROCESSOR

4MB RAM (EXPANDABLE TO 12MB)

84MB HARD DRIVE (170MB AVAILABLE)

PCMCIA TYPE II SLOT

8" MONOCHROME BACKLIT VGA DISPLAY

INTEGRATED COMPAQ EASYPOINT™ TRACKBALL

NIMH BATTERY PACK AND AC ADAPTER

WINLINK FILE TRANSFER UTILITY WITH CABLE

PREINSTALLED MS-DOS® MS-WINDOWS™ TABWORKS® LOTUS ORGANIZER

3-YEAR PICK-UP WARRANTY†

COLOR UNITS AVAILABLE CALL FOR INFORMATION

The Compaq Contura™ Aero™ is everything a great 486 subnotebook should be. First of all, it's quite small. Only 7.5" wide, 10.25" high, and 1.5" deep. And you'll find it's also very light, a mere 3.5 lbs.

But most importantly, the Contura Aero is an incredibly full-featured and useful working tool. It comes with 4MB RAM, an 8" monochrome backlit VGA display, integrated trackball, preinstalled software and more.

For added flexibility, consider the Contura Aero Option Pac.™ You'll get an additional battery pack, an external floppy disk drive, a PCMCIA data+fax modem, and a carrying case or backpack.

At last. A quality subnotebook with a price proportional to its size.

CONTURA AERO OPTION PAC

PCMCIA 2400/9600 DATA + FAX MODEM

3.5" EXTERNAL FLOPPY DISK DRIVE

ENHANCED BATTERY PACK NIMH

BACKPACK OR CARRYING CASE

ADD $319*

CONTURA AERO UPGRADES & OPTIONS†

ADDITIONAL 4MB RAM (8MB TOTAL) *ADD $245*

CONVENIENCE BASE *ADD $99*

3.5" EXTERNAL FLOPPY DISK DRIVE *ADD $125*

CANON BJ-10SX BUBBLE JET PRINTER *ADD $289*

COMPAQ DirectPlus

ASK FOR OUR NEW FREE CATALOG.

1-800-888-6079

WEEKDAYS 7-7, SAT. 10-4 CST

intel inside

*Price good only with purchase of Contura Aero purchased through Compaq DirectPlus. †Restrictions and exclusions apply. Compaq Aero is covered by a three-year pick-up warranty. Monitors, battery packs and certain options are covered by a one-year warranty. © 1994 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. DirectPlus is a registered service mark of Compaq Computer Corporation. Aero is a trademark and Option Pac is a service mark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. TabWorks is a registered trademark of Xerox Corporation. The Intel Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 109 on reader service card.

OS/2 TO CHICAGO: STRANGELY FAMILIAR

Done That, Been There

I'm so excited! I can't wait for Chicago to come out. Imagine all the things Chicago will offer: true multitasking, 32-bit graphics, the capability to configure each DOS application separately, no more 64K system resource heap, and long filenames. I can't stand this excitement. A friend told me more than two years ago that OS/2 offered all of this and more, and I told him he's a fool. If OS/2 offered all this, *PC Computing* would have written numerous features on it and had it prominently displayed on two of its covers before it was even released.

ROB JOHNSON, RJOHNSON@GCO.COM

Living Up to Its Name

Your special Best 200 June issue (page 104) was one of the most informative features I've ever read, and it couldn't have arrived at a better time. The most valuable data in your system and video reviews is the Winstone performance scores. Your new Pulse section is excellent—keep the beat going. The Radar scope is intriguing and the Help section is much more helpful.

ANTHONY F. NAVARRO
ANAVARRO@PIPELINE.COM

Mr. White's New Neighborhood

I had barely finished shaking out the loose subscription renewal cards from my June issue when I noticed that *PC Computing* was sporting a new look. The colorful headers on the articles are a nice touch. It was also good to see Ron White's column near the back of the issue—now I can get there without all that nasty page flipping.

JEFF ALLISON
JEFF@INNOSOFT.COM

Postliterate Clown Mauling

Evidently you felt the need to pander to the postliterate generation by going for garish typography and shopping-mall page layout. Your columnists should dress up in clown outfits and makeup so their photographs will match their pages.

GEOFFREY WITTIG
DANSVILLE, NEW YORK

Listening to Roger Rabbit

Your special June issue sure was *special*. I felt like I was in Toontown, where all was frantic, wild, and wacky, and your entire staff had become used-car salespeople on Prozac, wearing big, yellow, smiling faces.

ROGER ROTHENBERGER
HAMILTON, GEORGIA

PROZAC OR JUST PLAIN PASSION? It wasn't just the June issue; check out the editors' photos in this issue, too. By the way, want to buy an Edsel? ML

Dr. Jekyll and Mr. Copywriter

With your June issue, you've turned your editors into ad copywriters and all of your features into advertisements. Certainly there's enough hype and overly cute copy in your ads so that you don't need to carry it over into the editorial material. It's information overload—too jazzy and boring.

MILTON S. SNITZER
FLORAL PARK, NEW YORK

Virus Strikes: No Cure in Sight

Please tell me that *PC Computing* has just been hit by the *Entertainment Weekly* virus and that everything will be back to normal with the format of your fine publication.

CHRIS KLACZYK
ROCHESTER, NEW YORK

Out of the Box and into Your Heart

Wow! A magazine redesign that's a real improvement right out of the box. Kudos, and thanks!

STEVE MARSTON
GLEN OAKS, NEW YORK

Brave New Look

I like your new look—it's much more attention-grabbing and well-organized. Imagine: a magazine that's both fun and informative. What will you think of next, going to work without a tie? I'm sure you'll receive whine-a-grams from DOSaholics, nerds, suits, and other humor-impaired individuals, but never mind. Just refer them to the nearest tar pit. The future is ours!

HOWARD ROSS NEMEROV
SAN ANSELMO, CALIFORNIA

Today 200, Tomorrow 220?

I eagerly awaited your special June Best 200 issue, but was disappointed when I discovered that there were no comparisons for dot-matrix and ink jet printers. I realize that most businesses use laser printers, but there are still some of us who have to settle for less expensive printing solutions. I wouldn't have minded if you had to change the name of your guide to the Best 220 in order to include some other categories.

DON STOLIKER, JR.
PROVO, UTAH

Loss of (Cost) Consciousness?

Your Best 200 reviews of laser printers were based on everything except operating costs. I want to know about the cost of toner cartridges, the number of pages I can

HIGH-RESOLUTION LASER QUALITY PRINTING IS NO LONGER HIGH PRICED PRINTING. INTRODUCING THE OKIDATA 400e-SERIES.

If you thought that outstanding clarity and detail were only possible with a premium-priced laser printer, take a close look at the new OL410e. Now you can produce the same superb output you see here for a lot less. The OL410e is an easy-to-use 600 dpi-class output printer with 4 pages-per-minute speed, at a price well below typical 600 dpi lasers. With the OL410e, any PC user can look *Fortune 500*® on a home office budget.

Okidata also offers standout 300 dpi resolution with *PC Magazine's* Editors' Choice winning OL400e. The experts said, "...if you want laser quality, you won't find a better bargain." Both models support Okidata's tradition of reliability with an unsurpassed 5-year LED printhead warranty.

Stand Out

See Okidata 400e-Series print quality for yourself. Call 1-800-OKI-TEAM ext. 389 (U.S. or Canada) for your nearest dealer. You'll find values that make your output stand out.

YOUR BUSINESS HAS NEVER LOOKED BETTER.™

Circle 118 on reader service card.

OL400e

OL410e

The New

OKIDATA

a Division of Oki America Inc.

400e Series

Personal Printers.

Okidata, Reg. T.M., M.D. Oki Electric Industry Co., Ltd. "Never Business Has Never Looked Better" T.M. Oki America, Inc.

print from a cartridge, and whether the printer requires separate toner and developer cartridges.

W. Drew Fentress
Mechanicsburg, Pennsylvania

WHILE THE BEST 200 focused on performance testing, all of our reviews concentrated on product return on investment, especially printer reviews, where consumables are always a factor. **HB**

Proof's in the Printing

In the 4-ppm laser printer category of June's Best 200, you gave Epson's ActionLaser 1500 a perfect 10 for output quality and Hewlett-Packard's LaserJet 4L a mere 7.9. Are these the same two printers I saw three months ago when I was looking for a laser printer? I don't think so. The ActionLaser was typical 300-dpi quality, with the usual slight edge ragged ness, while the LaserJet gave cleaner and sharper edges than any other 300-dpi printer I've seen. Are you sure you didn't get a defective unit?

K.A. Boriskin
Bellingham, Massachusetts

EVALUATING OUTPUT was a key part of our printer testing for the Best 200. On our test documents—which consisted of graphics and text—the ActionLaser 1500 consistently had sharper output, especially when printing graphics. It was the clear leader. **SR**

Pssst! Wanna Buy a 750C?

Your review of color notebooks ("Top-Tier Totables: You Can Have It All," June, New! page 130) failed to mention that IBM's 750C is a rare commodity. I've placed several new orders for the 750C, but to no avail. In my experience, IBM's supply simply can't meet the demand.

John Ehlers
Goleta, California

IBM'S NOT ALONE. Active-matrix color displays are in short supply the world over—especially at 10.4 inches (IBM's unique size). For what it's worth, the new ThinkPads (the 755C and 360C) also come in passive-matrix flavor, for the truly impatient. **RS**

Dripping with Technojargon

Paul Somerson's selection of adjectives for Dell's Dimension XPS P90 (June, page 151) is curious—retina-rippling graphics, rock-solid construction, sexy styling. What's he using this system for?

M.P.
Belmont, California

COMING UP with snappy, rock-solid adjectives for hardware reviews. **PS**

32-Bit Salute

Your June Stacker 4.0 review ("Double Your Data, Double Your Fun," New! page 74) left out an important fact: Stacker is not compatible with Windows for Workgroups' 32-bit access. Most new systems shipping these days come with Windows for Workgroups 3.11. Because Windows has evolved into Windows for Workgroups 3.11, wouldn't it be prudent to begin testing software on it?

Kevin Krieger
Peru, Illinois

TRUTH BE TOLD, Stacker 4.0—and a passel of other disk-level utilities—have had problems with Windows for Workgroups' 32-bit *file* access, but we uncovered no problems with 32-bit *disk* access. Our apologies for any confusion this omission caused. **ML**

Contacts to the Max

Your review of GoldMine vs. Maximizer ("Keep Your Contacts in Place," June, New! page 86) did not give Maximizer a thorough evaluation. Statements such as, "Goldmine is fast. It leaves the competition . . . in the dust," need clarification. What is the benchmark? How many records were in the test database? Fast doing what—searching for a certain record, resorting the database, or accomplishing a complicated data query on various fields? Also, data in the Expense windows is related to personal expenses and not the client, as the review states.

Maximizer has unlimited user-defined fields, and although the user can't see more than six fields in a client window, do you really need to constantly look at the client's address? With Maximizer, the user designs

The OL410e.
600 dpi-class output and more.

Value by Design
Gorgeous print quality on a home office budget.

Print Quality
Extremely high resolution graphics and text. 600 dpi-class output for stand out presentations, reports and newsletters.

Speed
4 pages per minute. And among the fastest time to first page!

Interface
Parallel and serial interfaces let you connect to any type of PC, or connect to 2 PC's.

Size
1 1/4 square feet

Paper Handling
Any standard paper size, including envelopes, labels and transparencies.

Warranty
So reliable, we guarantee our LED printhead for 5 years.

Circle 119 on reader service card.

Call 1(800)OKI-TEAM, Ext. 389 (U.S. or Canada) for a dealer near you.

OKIDATA
a Division of Okidata

Okidata Reg. T.M., M.D. Oki Electric Industry Co., Ltd.

Mail BY PHONE, FAX, NET & POST:
Color Smarting • The E-Mailman Always Peeks Twice

what to see and what not to see. Plus, Maximizer has built-in, field-by-field data exchange, as the reconciliation of remote databases is highly important to the remote user. Maximizer works well, protects data, and has been proven in the field by tens of thousands of users as a solid product.

MIKE GOODE
SALES DIRECTOR, MODATECH SYSTEMS

DOS: Out in the Cold

In your glowing review of Hewlett-Packard's new DeskJet 560C ("Practically Perfect Printing," June, New! page 58), you fail to mention that HP's ColorSmart system is Windows-only, and that DOS users are left out in the cold. The review rates the 560C as a great buy, but as someone who uses WordPerfect 6.0 for DOS, it doesn't do me much good to rush out and buy a printer I can't use. Remember, there are still a few DOS applications and DOS users out here.

DANA HARKNETT
COMPUSERVE 71450,62

INDEED, HP's ColorSmart system is a boon only to Windows users, which makes the DeskJet 560C less attractive if you're running only DOS. **KC**

Hack E-Mail, Lose Job

Penn Jillette's column on e-mail privacy and Tonya Harding ("Remember Tonya?" June, page 366) was very well presented, and I agree: The reporters who hacked into Harding's e-mail should lose their jobs.

GARY DILLMAN
LEEDIL@NETCOM.COM

Constitutional Contradiction

I'm scared to admit that I agree with Penn Jillette's June column. The reporters who hacked Tonya's e-mail should have the book thrown at them. I bet they're like most reporters, who valiantly defend our Constitutional freedom of the press. Yet they hypocritically trample, without shame, an individual's Constitutional right to privacy.

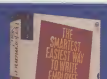
FRANK SHAW
COMPUSERVE 72722,102

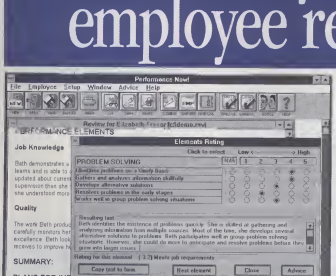
Correction

In June's Best 200 feature we incorrectly described Colorado Memory Systems' Jumbo Trakker 250. The product does include the option to restore files to directories other than the original directory. This function is called Restore redirect and is easily configurable.

SEND YOUR THOUGHTS TO Mail, *PC Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax us at (415) 578-7029; contact us via the Internet (76000.21@compuserve.com) or CompuServe (76000,21); or log on to PC Contact to post a public message (see page 250 for instructions). Letters must be signed and include a daytime phone number. If you contact us through e-mail, please include your phone number, city, state, and authorization to print your e-mail address. All letters become the property of *PC Computing* and will be edited for length and clarity.

Now it's easy to write employee reviews.





If you've ever put off writing an employee review because you didn't have the time – or you just plain hate writing them – *Performance Now!* is for you. *Performance Now!* tracks employee performance and coaches you through every step of the review. Then, through its exclusive Intelli-Text™ technology, *Performance Now!* takes your input and actually writes a review that reads like you wrote it yourself.

Join the over 100,000 business and human resources professionals who've made KnowledgePoint the leading developer of software for writing important employee communication documents.

- **Intelli-Text™**–Puts your thoughts into words
- **Employee Log**–Tracks employee performance between reviews
- **Rating/Essay Format**–Preferred by over 70% of U.S. Businesses
- **Form Design**–Lets you design forms to fit your organization
- **Language Checker**–Reviews text for inappropriate words or phrases
- **HR Advice**–Coaches you through every step

Order Today-
60-Day Guarantee
Only $119
1-800-727-1133

KNOWLEDGEPOINT
1129 Industrial Avenue
Petaluma, CA 94952 (707) 762-0333
M 205

Microsoft® Windows™ 3.1 operating system, or later 386 computer with 4 MB RAM

Circle 150 on reader service card.

33-MHZ
50-MHZ
66-MHZ

486 pow•e r•ful af•ford•able con•ser•va•tion graph•i•cal

STARTING AT **$745**

ACCELERATED VIDEO

Thanks to the new ALR Express, the whole relationship between price and performance has just been redefined. Powered by your choice of fast 486SX and 486DX2 microprocessors and fortified with accelerated graphics, the ALR Express flies through Windows™ without hesitation. Even the lowest priced models run at a quick 33-MHz. Yet all this performance is available for less than $750!

A perfect home office PC, network node, or general business system, the Express is an ideal match for today's sophisticated desktop publishing/word processing software and graphics oriented spreadsheet programs. Built for long-lasting performance, it offers a single chip upgrade path to higher levels of 486 processing and Pentium™ Overdrive™ technology.

Best of all, the Express is built by ALR. With a roster of recent awards that includes PC World's "Best Buy", 1994, "CADalyst's "Highly Recommended," PC magazines "Editor's Choice," BYTE's "Best of Spring Comdex, 1993," and Le Monde Informatique's "Product of the Year, 1993" ALR systems have become an established favorite among PC specialists and users worldwide.

So come on, find out what all the critics have been raving about. Visit your nearest authorized ALR reseller, and take a look at the new ALR Express and our complete family of award-winning systems and multimedia solutions. For more information call ALR today:

1•800•444•4ALR

ALR can be reached on Compuserve–GO ALR INC

ALR®
Advanced Logic Research, Inc.

9401 Jeronimo,
Irvine CA 92718
TEL: (714) 581-6770
FAX: (714) 581-9240

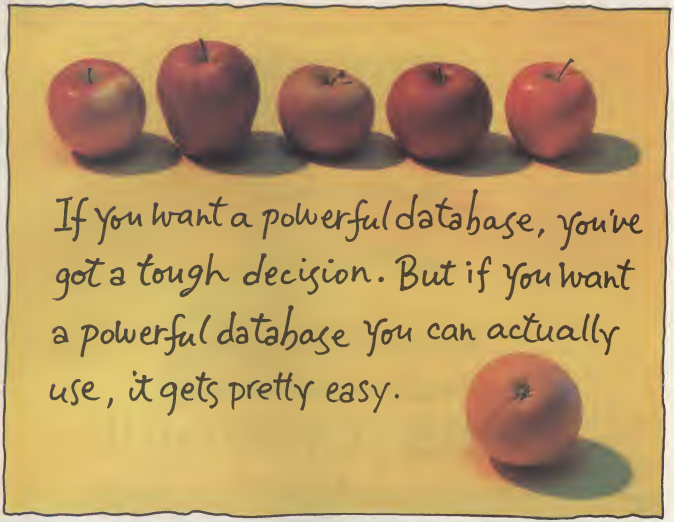
How do you teach an old or new PC new tricks?

mul•ti•me•dia

Install an ALR Digital Express Multimedia Kit! Featuring the same type of commitment to performance and value that's found in our Express systems, this kit will add state-of-the-art multimedia capabilities to your old PC or your new ALR system.

- Double Speed CD-ROM Drive
- 16-bit Wavetable Stereo Soundcard with DSP
- Speakers
- Software
- Manuals and Cables

Circle 142 on reader service card.



What's the difference between apples and oranges? In this case, it's the difference between powerful features and powerful features you can actually use.

Introducing Lotus Approach Release 3.0.

In 1983, Lotus® introduced the world's first approachable spreadsheet. Now we introduce a truly powerful database that's as easy as 1-2-3.® So easy that *PC Computing*, July 1994, calls it "The Amazing Code-Free Database."†

LOTUS NOTES READY

Now you don't have to be a programmer, or even think like one, to build a relational database that brings real efficiency to your work. With the new Approach® 3.0, demanding functions like tracking sales, managing projects, taking orders, invoicing,

$495 suggested retail price. $129 special price expires Dec. 31, 1994. **$299 SmartSuite upgrade promotional price available while supplies last. In Canada call 1-800-GO-LOTUS. ©1994 X10 and PowerKey are trademarks of Lotus Development Corporation. Access is a registered trademark and Windows is a trademark of Microsoft Corporation.

managing contacts and analyzing and reporting data are surprisingly simple.

Over 200 new usability and power features will take even the most overworked skeptic to productive database-user-for-life in two hours.* Don't doubt it. There's a good reason why Approach is the fastest-growing database in the business.

Easy as 1-2-3.

Lotus Approach is the only database with PowerClick™ reporting, letting you see and alter reports as you build them. Just click on the intuitive SmartIcons® to organize and calculate data. And, the friendly on-line Assistants help to design reports, forms, mailings, analyses and more. Compared to Microsoft Access,® well there's no comparison. As *Infoworld* recently commented, "Approach (3.0) looks like a better choice than Microsoft Access (2.0): easier to use, yet still fast and powerful."††

And Approach 3.0 extends the power of Lotus 1-2-3 allowing you to create intelligent forms, PowerClick reports, mailing labels, and dynamic cross-tabs on your worksheet without ever leaving 1-2-3.

Approach X10™ query technology delivers blazing speed in organizing, analyzing and manipulating databases. And, Approach provides the highest performance connectivity to virtually any database, from dBase® to Access, to Lotus Notes® and more. Plus Approach includes a powerful new macro capability for sophisticated application development.

And its advanced integration with Lotus Notes, the leading groupware application, makes it the obvious choice for people who work together in groups.

Only Lotus Approach 3.0 gives you:

PowerClick reportwriter (for WYSIWYG design)

InfoBox (instant on-screen manipulation)

Smart Assistants (to guide you)

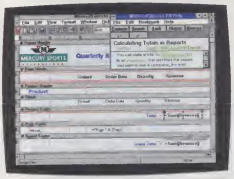
PowerKey™ technology (for direct access to existing data)

Lotus 1-2-3 Integration (for working with 1-2-3)

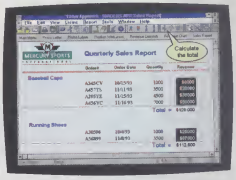
Lotus Notes Integration (for reporting on Notes data)

X10 speed architecture (for blazing speed)

Dynamic crosstabs (for drag and drop analysis)



Constructing a report in Access? "Easy"?



Constructing the same report in Approach. Easy.

$129 Special Introductory Price.

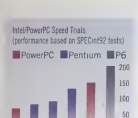
Lotus Approach is one of five Windows™ applications that make up Lotus SmartSuite.® Look into it while a SmartSuite upgrade costs just $299.** Call **1-800-TRADE-UP, ext. 9947** for more information.

Lotus.
Working Together.

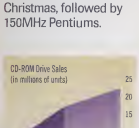
Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus, Lotus Notes, 1-2-3, Approach, SmartSuite, SmartIcons and Working Together are registered trademarks and PowerClick, dBase is a registered trademark of Borland International Inc. *MarketProbe International, New York, NY, February, 1993. †*PC Computing*, July, 1994. ††*Infoworld*, April 4, 1994

Pulse

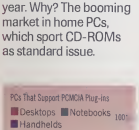
Microsoft's Take on Notes, High-Cost RAM, Low-Cost



Speed Thrills: For now, 100MHz Pentiums are the fastest processors, but expect RISC PowerPC 604 before Christmas, followed by 150MHz Pentiums.



Home Explosion: Sales of CD-ROM drives will more than double this year. Why? The booming market in home PCs, which sport CD-ROMs as standard issue.



Not for Desktops: PCMCIA is mainly a notebook phenomenon that will make inroads into only 3 percent of new desktop machines by 1995.

NOTES RIVAL

Information Anytime, Anywhere

Schedules under Your Sleeve: Timex and Microsoft have merged chronometer and computer to get this wrist-top PDA.

If you can't get the information you need when you need it, it's just wasted bits. So how can you keep all the corporate data you have stored on networks, desktops, and portable PCs neatly filed and easily accessible? If Microsoft has its way, it's all down to Exchange Server—the software giant's client-server messaging product, due out in early 1995.

Exchange Server's promise is this: It will open a single window into all the information that people need—files, databases, voice mail, and, of course, e-mail, faxes, and schedules. More comprehensive than the small-office solutions that handle only messages, Exchange Server will let you replicate information stores (called public folders) among users and workgroups. Exchange Server's front end—the InfoCenter—will first show up in Chicago and Windows NT (and eventually the Mac, Unix, and a number of other platforms).

Does this sound like Lotus Notes to you, too? Maybe, but Microsoft has avoided pitting its Exchange Server directly against Lotus's more established groupware product—with good reason. While Exchange Server provides more control over the information to be shared and who sees it—a big plus—Notes is already established as a platform for developing workflow applications for use across an entire enterprise. Also, Lotus's cross-platform back-end strategy (the Notes server runs on Windows, OS/2, NetWare, and Unix) makes it much more flexible for large organizations: The server for Exchange Server runs only on Windows NT—though it will work with Notes

UPDATES Best Bets and Bargains

ABC—FREE!
Micrografx is giving away its ABC SnapGraphics 1.0 until September 30, 1994. Check out its CompuServe CIS:MICROGRAFX forum or call (800) 653-3510.
Reader Service No. 601

DOS: LESS IS MORE
Win back stacks of disk space! MS-DOS Version 6.22 brings back compression with DriveSpace (not DoubleSpace). Contact Microsoft at (800) 426-9400 or (206) 882-8080.
Reader Service No. 602

GRAPHICS SPIN-OFF
Create presentation-quality charts and graphs with Aldus's $149 ChartMaker, the OLE 1.0 graphics module for Persuasion with a host of chart styles. Contact Aldus at (800) 628-2320.
Reader Service No. 603

MINI TOOLS
Fix disks with PC Tools 2.0, SpeedTools 2.0 for Windows, and Emergency Disk 2.0 for Windows—each just $29.95. Contact Central Point Software at (800) 964-6896 or (503) 690-8088.
Reader Service No. 604

PHOTOGRAPH BY ARNOLD TIDSEJO

through a third-party gateway.

But get this: Microsoft's Exchange Server has one feature Lotus can't touch, and that's a wrist-top client. Timex's Data Link watch downloads your schedule, phone book, and to-do lists using a light-sensitive aperture to read pulses sent from your desktop's CRT.

Thanks for the Memory Memory prices spiked last year because of panic following a fire in a crucial packaging plant. So why are prices still high? It's a software problem. Resource-hogging new versions of Excel, WordPerfect, and other programs are forcing us to places like SIMMs 'R' Us and driving prices up to $48 per megabyte, a 25 percent increase from last year.

Low, to Go Call the United Nations! Compaq, AST, and Toshiba are locked in a price war for hegemony in the portable market. For months, they've been slashing prices—not just on slow sellers but on some of their best and brightest, like Toshiba's T1950CS Satellite color notebook. Compaq recently topped the 20 percent discount mark by slashing up to 29 percent off the prices of some Aero models.

Plug and Play? Not Today It may be a while before all of Plug and Play's elements are in place. Check: a Plug-and-Play operating system (namely, Chicago), allegedly near the end of the year. Check: developer utilities from Intel, this fall. Check: Plug-and-Play BIOS or BIOS extensions to extend Plug and Play for Windows 3.1, also this fall. So far, so good. But don't hold your breath for the peripherals....

Your Tax Dollars at Work

Finally, the Information Superhighway is becoming businesslike. **CommerceNet,** the result of a $6 million federal grant and an equal amount in private funds, provides an online market for ordering technology products (privately, thanks to two-part encryption). The goal? Shorter procurement and development cycles and more competitive bidding. Contact CommerceNet at (415) 617-8790 or info@commerce.net.

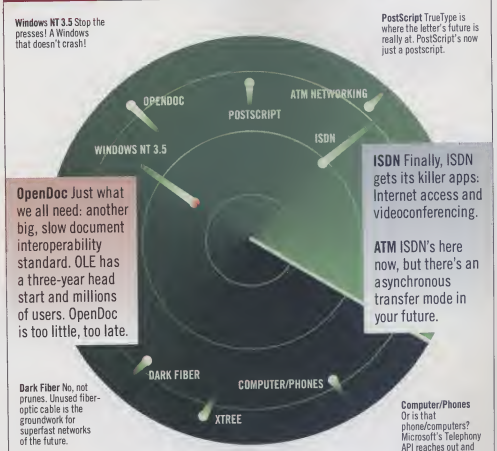
CD-ROM Prices

Here's the spread of the best prices we could find for double-speed SCSI-2 internal CD-ROM drives. Prices do not include tax or shipping and are accurate as of June 30.

Product	Price
Chinon 535	$305
TC Computers/Treasure Chest (800) 723-8282	
Plextor DM-3028	$269
MPS Multimedia (800) 533-4677	
Plextor DM-3028	$285
Storage USA (800) 538-3475	
Sony CDU 561	$289.83
Computer Discount Warehouse (800) 726-4239	
Toshiba 4101	$209
DirectWay 3000 (800) 882-8108	

Reader Service Numbers: Computer Discount Warehouse *605;* DirectWay 3000 *606;* MPS Multimedia *607;* Storage USA *608;* TCComputers/Treasure Chest *609*

RADAR DOS SUPERSTAR DIES—PC COMMUNICATION THRIVES



Windows NT 3.5 Stop the presses! A Windows that doesn't crash!

PostScript TrueType is where the letter's future is really at. PostScript's now just a postscript.

OpenDoc Just what we all need: another big, slow document interoperability standard. OLE has a three-year head start and millions of users. OpenDoc is too little, too late.

ISDN Finally, ISDN gets its killer apps: Internet access and videoconferencing.

ATM ISDN's here now, but there's an asynchronous transfer mode in your future.

Dark Fiber No, not prunes. Unused fiber-optic cable is the groundwork for superfast networks of the future.

XTree Everyone's favorite DOS file manager bites the dust. Can DOS itself be far behind?

Computer/Phones Or is that phone/computers? Microsoft's Telephony API reaches out and touches someone else's hardware.

What's on the scope? If it's near or moving toward the middle, pay attention to it. If it's moving off the screen, forget about it for now. Your time is too valuable.

A Game of Pen And Mouse

The nails are being hammered into pen computing's coffin, right? Well, not necessarily. Pair up that pen with a mouse and you have a pointing and handwriting tool (great for personalizing your PC fax messages). That's the killer combination that APT Appoint, Kurta, and Creative Labs are now offering.

APT Appoint introduced the $299 Gliffic Plus DeskSet last year, combining a mouse pad, a battery-powered pen and mouse, and a digitizing tablet. Kurta followed suit with a minitablet from its line of high-end artists' pens and a $25 2-volt battery-powered mouse for the PenMouse. And in the middle of the year, Creative Labs unveiled its $199 Aero-Duet wireless pointer, an infrared pen-and-mouse offering with 3-D controls for graphics and games.

Contributors to Pulse: MIKE HOGAN, SHYAMALA REDDY, RICHARD SCHWERIN, GEORGE MEIER, RAPHAEL NEEDLEMAN, JAMES OLIVER CURY.
Edited by MATTHEW J. LAKE

Chicago Watch: Multimedia

How many bells and whistles does it take to make multimedia? Check out Chicago's list: Based on **32-bit apps** doing **preemptive multitasking,** the windy OS supports **polymessage MIDI,** which uses a single interrupt for multiple MIDI instructions—more sound with less CPU drag. Other sound and vision offerings in Chicago: **Voice codecs** (compression/decompression algorithms) such as **TrueSpeech** crunch down business sound (read, voice messages); 32-bit **Indeo** and **Cinepak** codecs decompress video faster; and a new MCI device driver, APIs, and media player software decompress **MPEG** (Moving Picture Experts Group)-encoded video with or without assistance from hardware such as Sigma Design's ReelMagic.

SOFTWARE SALESWIRE

PERSONAL PRODUCTIVITY **CD-ROMs** GAIN GROUND

BUSINESS APPLICATIONS	Vendor	Price	Comments	MAY	JUNE
Office 4.0 for Windows	Microsoft	$750	Low price for leading Windows apps.	12	1
ProComm Plus 2.*x*	Datastorm	$129	Dialing directory with attachable notes.	9	2
Word 6.0 for Windows	Microsoft	$495	Wizards ease document formatting.	2	3
WordPerfect 6.0	WordPerfect	$495	New modes bring better graphics to DOS.	3	4
WordPerfect 6.*x* for Windows	WordPerfect	$495	Spreadsheets and databases, linked.	6	5

UTILITIES	Vendor	Price	Comments	MAY	JUNE
MS-DOS 6.0	Microsoft	$129	Undelete for both DOS and Windows.	1	1
Windows 3.1	Microsoft	$150	Robust multitasking, drag and drop.	2	2
QEMM 7	Quarterdeck	$100	New painless parameter changes.	3	3
UnInstaller 2.0 for Windows	MicroHelp	$79	System Cleanup ousts unused files.	11	4
Windows for Workgroups 3.11	Microsoft	$220	Share files, printers, and messages.	6	5

PERSONAL PRODUCTIVITY	Vendor	Price	Comments	MAY	JUNE
Street Atlas USA 2.0 CD-ROM	DeLorme	$169	View U.S. by city, area code, zip code.	11	1
Quicken 7 for DOS	Intuit/ChipSoft	$70	Organize with financial calendar.	1	2
Quicken 3.0 for Windows	Intuit/ChipSoft	$70	Offers financial calendar advantages.	3	3
Print Shop Deluxe Ensemble	Broderbund	$130	Print Shop's graphics effects on CD.	-	4
Calendar Creator Plus 2.0	SoftKey	$69	Schedule single or multiple groups.	7	5

Software Saleswire is compiled by D. Meier, Inc. once each month after gathering ranked order sales information supplied by the following software industry sources 888-Software, ABCO Distributors, American Software, Babbages, Baker & Taylor Software, COMPUSA, Computability, Computer Discount Warehouse, Corporate Software, Dustin Discount Software, Egghead Discount Software, Electronics Boutique, GateFA, GTSI, Ingram-Micro, Jesha Distributing, KeyVE, Lasik Inc\. Merisel, Multiple Zones, Navarre, PC Connection, Software Spectrum, Software, Etc. and Walldensoftware. They represent sales through some of thousands of resellers and more than $8 billion of software sales. A weighting system is applied to each entry based on three factors, the entry's position in the individual chart, the power of the contributing source (based on annual gross sales) and the relative strength of a source in a given category of software. All prices are suggested retail and are subject to change.

PHOTOGRAPH BY ARNOLD TIDSELJO

Go Ahead, Get Carried Away

Let Your Imagination Go Wild

GATEWAY 2000
Microsoft Office

Experience the World of Gateway 2000!

Go ahead. Let yourself get carried away. Because when you buy a computer from Gateway 2000®, you can lose yourself in a whirlwind of extraordinary computer systems and fantastic software. You'll feel like there's absolutely nothing on earth you can't do! So let your imagination run wild. Soon you'll be opening the doors to Gateway 2000 where prices are a breeze and computer dreams really do come true!

Most Gateway desktop systems now include larger hard drives, including a 1GB hard drive on our P5-90XL Pentium™-based machine. So there's no way you can get caught short of space. A TelePath™ fax/modem is included on our new Pentium-based multimedia systems. And CD-ROM drives are standard on all desktop systems. Just imagine what you can accomplish with Microsoft's Office Professional, including the latest versions of MS Word, Excel, PowerPoint® and Access®, now standard on all 486 PCI and Pentium-based systems.

A standard three-year limited parts warranty on all desktop systems and Gateway monitors tops off our tradition of bringing you the best service and support in the industry.

Sound too good to be true? Well, that's not all. The Gateway HandBook® 486 portable PC is now priced at legendary low prices.

Gateway 2000 has grown to become a Fortune 500 company, but we're still the down-to-earth Midwesterns who have always given you a good old-fashioned value. Go ahead, take a visionary's leap into the Gateway 2000 experience. Soon you'll be saying, "There's no place like Gateway, there's no place like Gateway."

GATEWAY2000

You've got a friend in the business. ®

800-846-2062

All the incredible talent in this ad is provided by Gateway 2000 employees and family members.

Better Homes and Gardens
Healthy Cooking
CD

Everything Under The Sun!

Supernatural power. Mesmerizing features. Stunning software. It's the Gateway 2000® experience. A place where you can have the best CPUs in the land — and so much more — when you buy a Gateway 2000 Pentium™-based system. And while others are huckstering their stripped-down Pentium-based computers, Gateway presents systems packed with the all the stuff dreams are made of!

There's virtually no end to the features included: hard drives up to 1GB, CD-ROM drives, outstanding sound and video performance, the best software, fax/modems on two new multimedia models, and a standard three-year limited parts warranty.

Your dream machine no longer eludes you. Gateway 2000 is making those dreams come true!

Raising The Roof Extras

We always want to keep our customers ahead of the industry. So along with Intel®'s super-charged Pentium processor, Gateway helps you extend the life of your system by including incredible 540MB, 730MB or 1GB hard drives on all Pentium-based systems. Get used to the feeling of being spoiled, because you also get CD-ROM drives, superior video performance *and* a ton of memory on *all* desktop systems!

All Pentium processor-based models include a PCI local bus and an enhanced PCI/IDE controller allowing your hard drive to transfer data up to twice as fast as non-enhanced systems.

And now Gateway's high-quality desktop systems *and* Gateway monitors are backed by a three-year limited parts warranty. Believe it — this is one of the best warranties you'll find anywhere!

Multimedia Mania

For those who insist on only the very best, your Shangri-La is our new P5-60 and P5-90 Best Buy multimedia systems. Watch out, 'cuz they're jam-packed with all the premium multimedia features you can imagine! Including a TelePath™ fax/modem and communications software so you can speak to the world from your own living room. And tunes never sounded so good with a 16-bit

sound card and Yamaha® stereo-quality speakers. Play your audio CDs, hear audio clips or record audio all in perfect harmony.

Wondering what "multimedia" *really* means for you? It's a whole new universe of knowledge, entertainment, communication *and* educational capabilities. Talk about being entranced! You'll experience interactive, full-motion video and stereo audio. And Gateway gives you the key to this universe in a super-fast, feature-packed machine.

Get the best of all possible worlds with these new P5-60 and P5-90 Best Buy multimedia machines!

Software Nirvana

It's a sweet deal. All Gateway Pentium-based systems now come with Microsoft Office Professional, an incredible combination of Microsoft's most popular business applications, including Microsoft Word, Excel, PowerPoint® presentation graphics program, and Access® database, all on a single CD with on-line manuals. These programs in Office Professional are so tightly integrated, they work together as if they were a single program. Also included is Corel Professional Photos CD Sampler with tools to view Photo CD images.

Call for more great software options including our value-packed Multimedia Starter Pack.

P5-90XL Paradise

Is it fantasy or for real? Well, it's the Gateway P5-90XL. This ultimate high-flying Pentium-based PC has a larger-than-life 1GB hard drive. You're gonna get all the power and speed you need for today *and* tomorrow! And an ATI GX video card using the Mach 64 graphics accelerator, one of the first and fastest 64-bit accelerators on the market. It's awe-inspiring to see the display on the 17-inch CrystalScan® monitor. Sound, you ask? Ensoniq®'s Soundscape™ wavetable sound card makes a staggering difference in audio quality. And you'll get a great balance of crisp highs and plenty of heart-pounding bass — in full stereo sound — from the Altec Lansing ACS-31 speakers, with subwoofer.

And for the system of *your* dreams, we'll configure a system specifically to fit your needs. Get everything under the sun with a powerful value-packed Pentium-based system from Gateway 2000!

GATEWAY 2000

"You've got a friend in the business."®

800-846-2062

ENHANCED IDE

intel inside pentium PROCESSOR

You'll be in paradise with a loaded Gateway P5-90XL machine!

Know No Boundaries

GATEWAY 2000 COLORBOOK

You'll be transported to outer bounds when you discover the ColorBook™ from Gateway 2000.® Experience the rapture of color portability *and* performance with a 250MB hard drive on our 50MHz and 75MHz models. A rainbow of 256 brilliant colors in VGA mode bursts from an incredible 10-inch dual-scan screen on three ColorBook models. You won't find another portable screen this big, this affordable, anywhere else.

And while everyone else is hiking up their color portable prices, Gateway still offers you an incredible value on our feature-packed ColorBooks, from the $1,999 SX model right up to the DX4-75. And our DX2-50 model recently won *PC World's* Best Buy award in the Power Moblile PC category.

All Gateway ColorBooks are based on the Intel® SL Enhanced 486 processor with enough power and memory to run all your Windows applications. Weighing less than 5.7 pounds, measuring 1.77-inches thin, all models include two PCMCIA Type II or one Type III slots, excellent battery life, carrying case and a great suspend/resume feature. Our DX2 and DX4 models also include PCMCIA fax/modems. You also get Microsoft Works™ or MS Office Professional standard.

No, it's not an illusion ... it's the ColorBook from Gateway 2000.

GATEWAY 2000 HANDBOOK 486

Visualize the ideal portable experience. On the road to enlightenment you'd like to have a lightweight, compact, real 486 PC at an uncommonly low price. The Gateway 2000 HandBook® 486 is so extraordinary, it's portable computing utopia! With unbelievable prices on all HandBook models (they start at just $999!) there's never been a better time to indulge yourself in a world of 486 power that you can take anywhere.

The HandBook's slight frame — weighing less than three pounds and measuring roughly 10 x 6 inches — makes it an enchanting little PC. The HandBook DX2-50 gives you more MIPs per pound than any other portable PC. With Microsoft Office Professional included, the DX2-50 is an unbeatable value. And at these prices you can get the HandBook as a companion to your desktop system.

The HandBook's features are astounding. It has a bright, backlit VGA screen and a comfortable, touch-type keyboard along with an external diskette drive and leather carrying case. With two batteries included, the HandBook also lets you "hot swap" — change batteries or peripheral while the PC is running without rebooting the system or losing data.

All Gateway ColorBook and HandBook portable PCs come with a standard one-year limited parts warranty. A special VIP warranty is available only at the time of purchase for an additional $100.

intel inside

You Can Have It All!

The Gateway 2000 Family PC

There's no place like home when you have a Gateway 2000® Family PC™ in the house. Every member of your family will be swept away as they discover inspiration, entertainment and learning experiences.

This fully equipped multimedia system takes you to a whole new dimension. You get a fast CD-ROM drive to run the best programs and games with sound, pictures, animation and video. With its high-quality sound card and speakers, the Family PC lets you play music CDs, hear audio clips or record audio — all with magical stereo sound.

The Family PC's fax/modem has all the communication software you need to access information and other computer users from all over the world through on-line services.

Experience a virtual software playground with Microsoft Works™ Multimedia Edition, MS Encarta 1994 Multimedia Encyclopedia, MS Money,™ **new** MS Complete Baseball, MS Golf, and Corel Professional Photos CD Sampler.

You won't find another home PC more loaded than the Gateway Family PCs and our Pentium-based multimedia systems — in any land.

3-Year Warranty

Gateway desktop systems come with one of the strongest warranties in the industry. All Gateway 2000 desktop PCs are backed by a three-year limited warranty on parts. The new three-year limited parts warranty includes Gateway monitors.

Gateway customers also receive a 30-day money-back guarantee and toll-free technical support. And *PC Magazine* readers recently honored us, for the fourth consecutive time, with their highest rating in *PC Mag's* Service and Reliability survey.

On-site service is available during the first year in most U.S. locations and may be provided without charge if our technicians determine it necessary.

For details on our new warranty and all of our service and support policies, please call or write for a free written copy.

Payment Options

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® Card, issued by Dial National Bank, Des Moines, Iowa.

To Other Worlds

Gateway 2000 customers in Canada and Puerto Rico receive toll-free telephone service in both countries (see the back page of this ad for special 800 numbers) along with award-winning technical support and CSA approvals. On-site service is available in some Canadian and Puerto Rican locations, and our international shipping rates are among the most competitive in the industry.

GATEWAY2000

"You've got a friend in the business."®

800-846-2062

GATEWAY 2000 FamilyPC

intel inside

A Gateway 2000 Family PC is your doorway to new worlds.

Printed on recycled paper with soy inks.

Gateway 2000 is a corporate sponsor of GLOBAL RELEAF

energy STAR

Multimedia Systems

4SX-33 FAMILY PC™

- Intel® 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS® 6.2 & WFW 3.11
- MS Works,™ Encarta, Baseball, Money,™ & Golf
- 3-Year Limited Parts Warranty

$1499

4DX2-66 FAMILY PC

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 128KB Cache
- 420MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Yamaha® Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works, Encarta, Baseball, Money, & Golf
- 3-Year Limited Parts Warranty

$1999

P5-60 BEST BUY

- Intel 60MHz Pentium™ CPU*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Yamaha Speakers
- TelePath™ II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan® Monitor
- Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2499

P5-90 BEST BUY

- Intel 90MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Yamaha Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey® Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2999

Professional Systems

4SX-33

- Intel 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works 3.0 CD
- 3-Year Limited Parts Warranty

4SX-33 $1299
4DX2-66 $1599
(w/ 540MB Hard Drive)

P4D-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 128KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2199

P5-60

- Intel 60MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2299

P5-90 XL

- Intel 90MHz Pentium CPU*
- 16MB RAM, 256KB Cache
- 1 GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- ATI Mach 64 with 2MB VRAM
- Double-Speed CD-ROM
- 16-Bit Wavetable Sound Card & Altec ACS-31 Speakers
- 3.5" Diskette Drive
- 17" Color CrystalScan 1776LE
- Tower Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$3999

Portables

HANDBOOK® 486

- 2.94 Lbs., 9.75" x 5.9" x 1.6"
- SL Enhanced Intel 486 or DX2 Processor
- 4MB or 8MB RAM (expandable to 20MB)
- 80 to 250MB IDE Hard Drive
- External 3.5" Diskette Drive
- 7.9" Backlit VGA Display
- 2 NiMH Batteries & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2® Ports
- Leather Carrying Case
- MS Works for Windows 3.0 or MS Office Professional
- MS-DOS 6.2, WFW 3.11 & Serial Transfer Cable

HANDBOOK 486SX-25
4MB RAM, 80MB Hard Drive, Works
$999

HANDBOOK DX2-40
8MB RAM, 130MB Hard Drive, Works
$1499

HANDBOOK DX2-50
8MB RAM, 250MB Hard Drive, MS Office Professional
$2499

COLORBOOK™

- 5.7 Lbs., 11.7" x 8.5" x 1.77"
- SL Enhanced Intel 486, DX2 or DX4 Processor
- 4MB or 8MB RAM (expandable to 20MB)
- 3.5" Diskette Drive and Removable 250MB IDE Drive
- 10.3" or 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots (1 Type III)
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial, PS/2 & VGA Ports
- MS Works or Office Professional
- MS-DOS 6.2 & WFW 3.11

COLORBOOK 486SX-33
4MB RAM, Case, Works
$1999

COLORBOOK DX2-40
4MB RAM, Fax/Modem, Case, Works
$2699

COLORBOOK DX2-50
8MB RAM, Fax/Modem, Case, Office Professional
$3199

COLORBOOK DX4-75
8MB RAM, TelePath Fax/Modem, Case, Office Professional
$3699

Toll free from Canada 800-846-3609

Toll free from Puerto Rico 800-846-3613

GATEWAY2000
"You've got a friend in the business."®

800-846-2062

*Intel Verified: Upgradable

intel inside

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 605-232-2561
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

Extraordinary Extras!

A wonderland of value: Gateway 2000's peripherals and software, sold only with the purchase of a system.

MULTIMEDIA

Basic Audio Multimedia Kit

Here's everything you need to add multimedia to a Gateway PC.

- Gateway 2000 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
- 2 Labtec® CS-180 speakers

$109 *(with system purchase)*

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq® Soundscape™ 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
- New Altec Lansing ACS-31 three-piece speaker system
- MidiSoft® Sound Explorer and Time Warner's Aegis™ software

$249 *(with system purchase)*

Altec Lansing ACS-31 Speakers

A Gateway exclusive from Altec Lansing: a three-piece speaker set at a two-piece price. Two 3-inch free-standing speakers crank out up to five watts per channel while the subwoofer can deliver 15 watts of heart-pounding bass. **$119**

Multimedia Software Starter Pack

You get nearly $700 worth of software for less than $100! Package includes Cinemania '94, Mad Dog McCree, Tuneland, Mayo Clinic Family Health Book, Better Homes and Gardens Cookbook, The Lawnmower Man, Sitting on the Farm, Mavis Beacon Teaches Typing, Chess Master 3000, U.S. Atlas and World Atlas. You also get a compact disc cleaner and 20-disk storage rack. **$129**

MONITORS

CrystalScan® 17-Inch Monitor

Non-interlaced color monitor with intelligent multi-scanning analog color display capable of 1280 x 1024 resolutionin non-interlaced mode, .26 dot pitch.
Upgrade from a 14-inch CrystalScan 1024NI monitor **$395**
Upgrade from a 15-inch CrystalScan 1572 monitor **$335**
(Prices good only for upgrades at the time of system purchase.)

COMMUNICATIONS & STORAGE

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Includes CommWorks™ data and fax communication software, CoSession™ Host remote diagnostics, plus a CompuServe® trial membership. **$99**

Colorado Memory Systems® TBU

250MB internal tape backup unit copies up to 9.5MB per minute. Comes with MS Windows™ and DOS software, one tape and cable. **$149**

PRINTERS

Hewlett®-Packard 4L LaserJet Printer

A full-featured 300dpi printer loaded with enhanced PCL 5 and 26 scaleable typefaces with 1MB standard HP Memory Enhancement Technology. Parallel cable included. **$699**

Hewlett-Packard 4L LaserJet Printer

A 600dpi printer for four times the dots of 300dpi laser printing with enhanced PCL 5 and 45 scalable typefaces. 2MB standard memory and 3 universal SIMM slots available for additional memory or PostScript fonts. Parallel cable included. **$999**

Epson® Stylus™ 800 Ink Jet Printer

Get the look of a laser at a dot matrix price with the Stylus 800. Prints 150 characters per second at 360dpi — fast and quiet! **$289**

Call for other printer options, including more ***Hewlett-Packard*** *printers.*

NETWORKING

Ethernet Adapter from 3Com®

Ultra high-performance 16-bit Ethernet cards from the world leaders in Ethernet technology.
16-bit Triple Media Card supports BNC, AUI and Twisted Pair media **$119**
16-bit Twisted Pair only **$99**

Token Ring

IBM® 16-bit Token Ring card **$429**

PORTABLES

Peripherals and upgrades available only with a Gateway portable purchase.

PCMCIA Cards

- TelePath 14,400 Fax/Modem. **$249** *(Also in XJACK® version, same price)*
- 9,600/2,400 Fax/Modem. **$149**
- Ethernet adapter. **$149**
- Token Ring adapter. **$449**
- HandBook® VGA adapter. **$229**

Other Accessories

- 2.2Ah NiMH batteries. *Call for prices*
- HandBook 3.5" external floppy. **$99**
- ColorBook™ carrying case. **$49**
- HandBook leather carrying case. **$55**
- Extended VIP warranty — we ship a replacement to you within 24 hours during warranty. Point of sale only. **$100**

Call the Gateway 2000 special Component Add-ons division at 800-846-2080 for our complete line of extras for Gateway customers.

GATEWAY2000

"You've got a friend in the business."®

800-846-2062

© 1994 Gateway 2000, Inc. Gateway 2000, AnyKey, CrystalScan, HandBook, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and ColorBook, DuoLine, Family PC, EZ Point and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, Pentium and OverDrive are trademarks or registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Monitors' diagonal measurements indicate the size of the cathode-ray tube. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax

MULTIMEDIA VIDEO CAPTURE · MULTIMEDIA VIDEO CAPTURE

Create a Moving Experience!

VIDEO-IT!™ & VIDEO BASIC

Video and Still Image Capture
Easy to Use
Low Cost

NOW SHIPPING!

Propel your applications with the power of motion video. Any Windows application, from presentations, documents to training, can be enhanced with compelling videos made on your own PC, using ATI's new VIDEO-IT! and VIDEO BASIC capture cards.

It's simple to do. Simply connect your camcorder, VCR or other video source to your PC. Click on the record button in ATI's video software and your video is captured in vibrant colors.

MEDIACAPTURE for easy capture and editing

Add video to any application. Add motion to your message by inserting video into any OLE compliant Windows application. Or capture still images using your video camera. And you can replay your videos on any computer.

Complete control of video clips

A video is worth a thousand pictures! Enhance your message with video; get ATI's VIDEO-IT! or VIDEO BASIC. Turn your PC into a video production studio.

FEATURES

*CAPTURE RATES****

Resolution	VIDEO-ITI™	VIDEO-BASIC
160x120	30 fps	24 fps
240x180	24 fps	15 fps
320x240	15 fps	10 fps

VIDEO BASIC

- Affordable video capture solution
- Full motion video capture
- Full color still image capture
- Two step compression using Indeo, RLE, Video 1 and Cinepak
- includes "ATI TV" for viewing video-in-a - window at any graphics resolution
- "**MEDIA**CAPTURE" for video control and editing
- Easy to install
- 3 software selectable inputs (2 composite, 1 S-VHS)
- Supports NTSC and PAL
- Compatible with any graphics card and system configuration
- 5 year warranty
- Priced at $249*

VIDEO-IT! adds

- Professional video solution, ideal for longer sequences
- Single step video capture and compress using Indeo video
- Save time, produce video in 90% less time (1 min. vs. 15 mins.)
- Conserves disk space, uses 80% less storage (9MB/min. vs. 50MB/min.)
- Higher frame rate capture performance
- Superior video image quality with comb filter
- Comes complete with $500 of free software**: **MEDIA**MERGE for video editing and production, and ACTION! for presentation development
- Priced at $499*

indeo INTEL VIDEO TECHNOLOGY

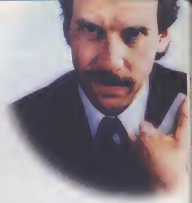
ATI TECHNOLOGIES INC.
Perfecting the PC

ATI TECHNOLOGIES INC.
33 Commerce Valley Drive East
Thornhill, Ontario Canada L3T 7N6
Telephone: (905) 882-2600 ext. 4221
Facsimile: (905) 882-2620
CompuServe: GO ATITECH 76004,3656

© Copyright ATI Technologies Inc. 1994. ATI, VIDEO-ITI, VIDEO BASIC, MEDIAMERGE and MEDIACAPTURE are trademark and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Features and specifications are subject to change without notice. Product may not be exactly as shown.
*Suggested US retail price, dealers may sell for less. **Approximate suggested US retail prices if purchased separately. ***Capture and playback rate may vary depending on system configuration.

Circle 112 on reader service card.

Paul Somerson



STAR SYSTEM

What are the scariest ten words in the English language? *"We're from the government and we're here to help you."* The last thing any business wants is a visit from regulation-crazed do-gooder feds. It's worse than **FLESH-EATING BACTERIA.** This explains why the software industry is caving in to morality-thumping cranks who want to control what you run on your PC. Better to deal with these **BLUE-NOSED BOZOS** than the congressional kind.

Recently, the Software Publishers Association and four other PC software organizations announced plans for "the first joint effort to develop a ratings system for the entire personal computer software industry." Actually, this effort is a **COUNTERPUNCH** to a rival ratings scheme trotted out by the IDSA, a group of large video game companies.

The puritanical pinheads screaming for these ratings position it all as an aid to kids. But don't kid yourself. It's a **DEVIOUS CENSORSHIP EFFORT,** pure and simple: First isolate and stigmatize the software they don't like. Then pressure stores to ghettoize it in **BACK ROOM CYBERIAS,** and eventually to stop carrying it. Argue against this and they make you sound like some digital Hannibal Lecter.

It's true that some software out there is awfully violent. And some might offend more **STIFF-NECKED** or narrow-minded consumers. But these days, with brutal Bosnian ethnic cleansing assaults, savage Rwandan machete attacks, and explicit **PAULA JONES DEPOSITIONS** in the headlines, there's stuff in your daily newspaper that's a lot less appropriate for some kids. Maybe it all ought to be rated "R" for reality.

The prudes out there want to be their **BROTHERS' JAIL-KEEPERS.** They want to throttle free expression. And their target is *not* just multimedia titles. They're now starting to go after communications software, claiming it connects children with perverts who prowl the Internet. Online services are peeking through your mail, armed with lists of forbidden **"GEORGE CARLIN" EXPRESSIONS.** What's next—a lock on word processors so you can't type four-letter words? Enough already!

However, there's an **ENTIRELY DIFFERENT** kind of rating system that *does* make sense. And we're adopting it in this issue. It's a new mechanism for rating the quality of computer products in four key areas—usability, performance, technology, and our overall verdict. Ranging from **FIVE STARS** (offering exceptional performance or features for the price) to **ONE STAR** (missing necessary features or suffering from subpar implementation), it will help you identify the best products for your particular needs.

Individual scores are determined after **EXHAUSTIVE TESTING AND ANALYSIS** by a select team of experts from our lab and senior editorial staffs. This star system is the result of nearly a year's worth of rigorous statistical and procedural work to create ratings that you can rely on without hesitation. We hope you'll find it valuable.

PHOTOGRAPH BY JAMES McGOON

At $8,495 the Xerox 4900 is the world's most affordable color laser printer.

Introducing the Xerox 4900 Color Laser Printer, the newest member of the Majestik Color Series.

Now anyone can afford to put the productivity, impact, and power of Xerox Intelligent Color into any document, and they can do it from anywhere on the network.

You get 3 PPM color and 12 PPM b&w output, resolution up to 1200 x 300 DPI, patented Quad Dot Technology, Adobe PostScript Level 2 compatibility, and the Xerox Total Satisfaction Guarantee.

Best of all, at this price, it's the color printer that won't leave you in the red.

For more information on the Xerox 4900 and an actual output sample, simply give us a call at:

1-800-ASK-XEROX, ext. WT01.

THE DOCUMENT COMPANY
XEROX

XEROX® The Document Company® Majestik Color Series, and 4900 are trademarks of XEROX CORPORATION. PostScript is a trademark of Adobe Systems, Inc

Circle 177 on reader service card.

Ed Bott

Just the FAQs

Hi. My name's Ed, and I'm a newbie. (Hi, Ed!) Welcome to this month's meeting of Newbies Anonymous, an informal self-help group for those of us who feel lost, bewildered, and completely overwhelmed by the Internet. If you've ever traveled in an exotic foreign land—like Nepal or Tierra del Fuego or Southern California—you know the feeling. Connecting to the Internet offers more opportunities for public humiliation than a Friars Club roast or a high school prom. And there's nothing like a Usenet newsgroup—with 3 million people looking on—to show off our lack of technical knowledge and our underdeveloped social skills. Hey, we're all newbies once. Here's how to get over it.

For starters, learn the language. The folks at Berlitz pioneered the total immersion technique, and it works just as well with Netspeak as it does with Norwegian. Read a few hundred newsgroup postings. Pay attention to how the regulars talk. You don't download a file, you FTP it. It's not a forum, it's a newsgroup. Don't forget the acronyms, either. Like IMHO (in my humble opinion), RTFM (read the, uh, manual), and LJBF (let's just be friends—useful in the alt.sex hierarchy).

But total immersion doesn't mean full participation. Resist the urge to post until you're sure you know how a particular newsgroup works. If Mark Twain had had a modem, he might have said: "It's better to lurk quietly and be thought a fool than to post a stupid question to 30,000 newsgroup servers and remove all doubt."

Besides, every stupid question has already been asked and answered. Anyone determined to become a Net expert reads the FAQs—the lists of Frequently Asked Questions designed to keep us newbies from gobbling up bandwidth by repeatedly asking the same questions. One of the best is Answers to Frequently Asked Questions about Usenet, found in news.announce.newusers. Like most FAQs, it's cross-posted in news.answers, which is a great place to look for Net wisdom. And every FAQ can be FTP'd from rtfm.mit.edu.

FAQs aren't the only source of wisdom on the Net. Some of the most entertaining and instructive reading in cyberspace can be found in documents written just for us newbies. Emily Postnews, for example, is the foremost authority on proper Net behavior. Check out her occasionally caustic advice on how *not* to act on the Net. ("Q: What does foobar stand for? A: It stands for you, dear.") For the latest edition of Emily Postnews Answers Your Questions on Netiquette, look in news.announce.newusers.

With apologies to Robert Fulghum, everything we need to know about newsgroups we probably learned in kindergarten. Like these simple lessons:

Be nice. Newsgroups bring out the worst in some people. Faced with a rational argument, they respond with abuse and invective. In Netspeak, a posting that crosses the line into personal attack is called a *flame*. We newbies are often horrified the first time we see a flame, especially if it's directed at us. Relax. Get over it. That's what kill files are for.

Clean up after yourself. Every posting that goes out to a newsgroup gets routed through a few thousand servers (at least), and potentially stored on hundreds of thousands of hard drives. Some newsgroup readers let you attach complex *signatures* to the end of each posting. If your signature file is longer than four lines, you might as well hang a sign on your back saying, "Flame me!" Another bandwidth-wasting breach of netiquette: Littering a newsgroup with meaningless messages ("I agree." "This is a test.") and simple thank yous that are better sent by e-mail.

Don't be a bore. There are a few ancient stories that simply won't vanish from the Net. Like the one about the dying kid who wanted to set a record for receiving the most get well cards. Or the rumor that the FCC wants to impose a tax on modems. The kid set the record and doesn't want any more get well cards. The FCC doesn't raise taxes. Every so often some newbie resurrects one of these tired old yarns. But it won't be one of us.

Every **STUPID QUESTION** *has already been asked and* **ANSWERED . . .** **FAQs** *are there to keep us newbies from* **GOBBLING** *up bandwidth with the same old questions.*

And then there's semi-criminal behavior. Want to get lots of vicious, intensely personal mail aimed straight at you? Then try *spamming* the Net—sending identical copies of one posting to dozens, even hundreds of newsgroups. I won't name the two bozos who posted ads for their law firm's services on 6,000 Usenet newsgroups, because they don't deserve any more free publicity. They broke two cardinal rules of the Internet: Send advertising only to those who want it, and post only where it's appropriate. Sadly, they weren't even newbies—they knew exactly what they were doing.

Wanna be a good Net citizen? Just learn the basic ground rules. You'll dodge the wrath of the Net's elders. And maybe you'll get a chance to help some poor newbie.

PHOTOGRAPH BY JAMES McGOON

Get Your Editors' Best Buy, Top Choice,

EXPERTS NAME THE ZEOS® PANTERA™ #1

PC MAGAZINE EDITORS' CHOICE April 12, 1994

PC Computing BEST May 1994

PC WORLD 50 June 1994

Windows EXPERTS PICK June & August 1994

"Rocket fast performance and a great price make this our favorite Pentium of the lot," *PC/Computing* said.

Top computer experts at seven leading publications agree that the ZEOS Pantera is the best Pentium-processor based system available.

The ZEOS Pantera has earned:

- *PC Magazine* Editors' Choice (April 12, 1994)
- *Computer Shopper* "top choice" (April & August 1994)
- *PC/Computing* BEST (May 1994)
- *PC World* Best Buy (June 1994)
- *Windows Sources* Experts' Pick (June & August 1994)

These prestigious awards all add up to one thing–ZEOS computers are your #1 choice.

Don't settle for less. The Pantera has it all. *PC/Computing* concurs: "Hot performance, room for expandability, and a low price make this system our top choice."

POWER BEYOND POWER

"At the top is the new ZEOS Pantera-66, a Pentium-66 that recorded the fastest benchmark results ever to come out of the PC World Test Center," reported *PC World*.

PC Magazine said: "ZEOS Pantera-66 combines quality features, good price, and high performance.... A consistently above-average performer on all our benchmark tests...."

The ZEOS Pantera received the highest marks on many benchmark tests including the important Graphics WinMark and Disk WinMark tests run by *PC Magazine*. In fact, its Disk WinMark surpassed the next closest competitor by 35 percent!

What makes the Pantera fly at supersonic speeds? A ZEOS designed motherboard with exceptional features such as a hot new integrated PCI Local Bus IDE Controller (supporting up to four IDE devices) that, as *PC Magazine* said, "pushes disk access into new territory."

PENTIUM & 486 PANTERAS

PC MAGAZINE EDITORS' CHOICE June 28, 1994

Even better, we now incorporate the latest award-winning Pantera technology (including PCI) to our 486 PCs. The expanded Pantera line includes more processors–from a 486SX-25 to a DX4-100 all the way to a Pentium-90! The best news: The Pantera DX4-100 also earned *PC Magazine*'s Editors' Choice (June 28, 1994).

These new, improved and even more affordable systems feature local bus IDE hard drives from 214MB to 1GB; memory from 4MB to 24MB; a new 64-bit video controller; 3 PCI slots (one contains our PCI local bus video card) in addition to 5 ISA slots; and on-board Fast SCSI-2 option. And all Pantera systems are 100% compatible with every major network operating system on the market.

yes It runs with NetWare

ALL THE EXTRAS INCLUDED

What's more, we give you all this at a marvelous price. There's no doubt about it. *PC/Computing* said: "We suggest you spend your money on this machine–it offers the best value of any system we tested." *Windows Sources* agrees: "ZEOS Pantera offers the best performance for the price."

The value doesn't stop with your purchase. You get the best service and support in the business. In fact, no company has won more *PC Magazine* Readers' Choice for Service & Reliability awards than ZEOS–six in all. And we were the first to provide 24-hour toll-free technical support–every day!

PC MAGAZINE SERVICE & RELIABILITY READERS' CHOICE

ZEOS offers you all this and more. It's easy to see why the Pantera is the "number one power desktop Best Buy." It's the Editors' Choice. Make it your choice. As *PC/Computing* said, "there's no doubt which machine you should choose: ZEOS's Pantera...this is a deal you simply can't pass up." Call your ZEOS Systems Consultant now at 800-554-5218.

Choice, Experts' Pick, BEST ZEOS® PC Now!

PROCESSORS	PACKAGE 1	PACKAGE 2	PACKAGE 3	PACKAGE 4
486SX-33	**$1495** Lease $63/mo.	**$1795** Lease $65/mo.	**$2295** Lease $83/mo.	**$2845** Lease $103/mo.
486DX-33	**$1645** Lease $60/mo.	**$1945** Lease $70/mo.	**$2445** Lease $89/mo.	**$2995** Lease $108/mo.
486DX2-66	**$1745** Lease $63/mo.	**$2045** Lease $74/mo.	**$2545** Lease $92/mo.	**$3095** Lease $112/mo.
DX4-100	**$1995** Lease $72/mo.	**$2295** Lease $83/mo.	**$2795** Lease $101/mo.	**$3345** Lease $110/mo.
PENTIUM-60	**$1995** Lease $72/mo.	**$2295** Lease $83/mo.	**$2795** Lease $101/mo.	**$3345** Lease $110/mo.
PENTIUM-66	**$2095** Lease $76/mo.	**$2395** Lease $87/mo.	**$2895** Lease $105/mo.	**$3445** Lease $114/mo.
PENTIUM-90	**$2395** Lease $87/mo.	**$2695** Lease $98/mo.	**$3195** Lease $105/mo.	**$3745** Lease $124/mo.
More processors available. Call for details.	■ 4MB RAM	■ 8MB RAM	■ 16MB RAM	■ 24MB RAM
STANDARD WITH EVERY ZEOS PANTERA® SYSTEM	■ 214MB local bus IDE hard drive w/32K cache	■ 528MB local bus IDE hard drive w/256K cache	■ 720MB local bus IDE hard drive w/128K cache	■ 1GB local bus IDE hard drive w/256K cache
■ Genuine Intel Processor.	■ 3.5" 1.44MB floppy drive	■ 2X CD-ROM drive, 3.5" 1.44MB floppy	■ 2X CD-ROM drive, 3.5" 1.44MB floppy	■ 2X CD-ROM drive, 3.5" 1.44MB floppy
■ PCI local bus color graphics card upgradable to 2MB.	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM	■ 64-bit Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM
■ Two high-speed serial ports and one enhanced parallel port.	■ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ ZEOS 15" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch	■ ZEOS 15" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
■ Three PCI slots and five ISA slots.	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans	■ Six-bay desktop case with two cooling fans
■ Optional on-board Fast SCSI-2 socket.	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse	■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse
■ Flash BIOS.			■ Choice of Lotus Windows application	■ Choice of Lotus Windows application
■ 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.				
■ ZEOS 101-key space-saving keyboard.				
■ FCC Certified Class B; UL Listed.				
■ Complete ZEOS Customer Satisfaction Package.				

intel inside

PENTIUM EXTRAS:

- RAM expandable to 192MB.
- Integrated business audio.

486 EXTRAS:

- RAM expandable to 128MB.
- EPA Energy Star compliant.

FAVORITE OPTIONS

528MB TO 1GB HDD UPGRADE $295

1MB TO 2MB VIDEO RAM UPGRADE $59

DIAMOND STEALTH 64/PCI VIDEO CARD WITH 2MB VRAM $249

UPGRADE FROM A 14" TO A 15" MONITOR
ZEOS SVGA NI, 1024 x 768, flat screen $95

UPGRADE FROM A 15" TO A 17" MONITOR
ZEOS SVGA NI, 1280 x 1024 ..... $395

ADAPTEC 6360 SCSI CONTROLLER CHIP
For on-board SCSI. Includes drivers $49

14.4 BPS V.32 BIS MODEM WITH 14.4 BPS SEND/RECEIVE FAX $129

96/48/24 V.42 BIS SEND/RECEIVE FAX MODEM $49

INTERNAL TAPE BACKUP
80 to 250MB (with compression), includes backup software $159

10-BAY VERTICAL CASE $95

MULTIMEDIA UPGRADE
16-bit sound card. Stereo speakers $148

LOTUS SMARTSUITE UPGRADE
Five Windows applications in one box! $299

Many other affordable upgrades and options available. Call for details!

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Government: 800-245-2449, Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card, COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

CALL NOW TOLL FREE 800-554-5218

ZEOS INTERNATIONAL, LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. The Energy Star emblem does not represent EPA endorsement of any product or service. All products and company names are trademarks or registered trademarks of their respective holders. Intel inside and Pentium are trademarks of Intel Corporation. ZEOS is a registered trademark. Z-Card and Computers Now! are registered servicemarks; Pantera is a trademark of ZEOS International Ltd. © 1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). PAN-PCC-9409

Circle 248 on reader service card.

The ZEOS® Pantera™ Is The #1 Pentium PC.

We could fill this page with self-indulgent comments about how technically superior our Pentium processor-based systems are, how they perform far better than the competition, how great a value they are – and so much more. But why listen to us, the manufacturer, when top editorial experts at seven leading publications said the same thing – and far more

PERFORMANCE:

"At the top is the new ZEOS Pantera-66, a Pentium-66 that recorded the fastest benchmark results ever to come out of the PC World Test Center."
PC World, Best Buy, June 1994

"In terms of performance, the Pantera-66 left little to be desired…this machine scored high consistently and laid claim to no low scores whatsoever."
PC Magazine, Editors' Choice, April 12, 1994

VALUE:

"ZEOS Pantera-66 combines quality features, good price, and high performance..."
PC Magazine, Editors' Choice

"A standout in speed and value…we suggest you spend your money on this machine – it offers the best value of any system we tested…this is a deal you simply can't pass up."
PC/Computing, BEST, May 1994

THE EXPERTS CONCLUDE:

"…one system stands out from the rest: the ZEOS Pantera."
Windows Sources, Experts' Pick, June 1994

"…the most desirable computer in the group."
Computer Shopper, Top Choice, April 1994

"…there's no doubt which machine you should choose: ZEOS's Pantera-66."
PC/Computing, BEST

OK, so maybe we were a little indulgent, but that's what the experts said – and they all agree that the ZEOS Pantera is the top choice. Make it your choice. Call a ZEOS Systems Consultant today.

PC MAGAZINE EDITORS' CHOICE April 12, 1994 · PC WORLD BEST BUY June 1994 · Windows SOURCES EXPERTS' PICK August 1994

PC MAGAZINE EDITORS' CHOICE, *PC WORLD* BEST BUY, *WINDOW SOURCES* EXPERTS' PICK & *COMPUTER SHOPPER'S* "TOP CHOICE"

PENTIUM-60 .....$2995
PENTIUM-66 .....$3095
PENTIUM-90.....$3395

- Intel 60MHz, 66MHz or 90MHz Pentium CPU
- 16MB RAM, 256K SRAM cache
- 528MB local bus IDE hard drive, 256K cache
- 2X CD-ROM drive, 3.5" 1.44MB floppy disk drive
- Diamond Stealth 64/PCI local bus SVGA color graphics card with 2MB VRAM
- ZEOS 15" 1024 x 768 NI SVGA color monitor, .28mm
- 2 high-speed (16550) serial ports, 1 enhanced parallel port
- 3 PCI slots, 5 ISA slots
- Integrated business audio
- On-board SCSI socket
- Flash BIOS
- 10-bay vertical case with two cooling fans
- 101-key space-saving keyboard
- MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse, choice of Lotus application

PC Computing BEST May 1994 · Windows SOURCES EXPERTS' PICK June 1994

PC/COMPUTING BEST & *WINDOWS SOURCES* EXPERTS' PICK MULTIMEDIA SYSTEM

PENTIUM-60 .....$3538
PENTIUM-66 .....$3638
PENTIUM-90 .....$3938

Above PC modified to include:

- 16-bit sound card
- Amplified stereo speakers
- 17" 1280 x 1024 NI SVGA color monitor, .28mm, upgrade

CALL NOW TOLL FREE
800-554-5218

Fax Orders: 800-363-1205 or 612-362-1205. Phone Orders: Government: 800-245-2483; Outside U.S. and Canada: 612-362-1212. Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card,® COD and affordable leasing programs.

ZEOS THE PENTIUM PROCESSOR SOURCE

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, $1 purchase option. All prices, specifications and availability are subject to change without notice, call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective leaders. Intel Inside and Pentium are trademarks of Intel Corporation in the USA and other countries. ZEOS is a registered trademark. Z-Card and Computers Now! are registered servicemarks; Pantera is a trademark of ZEOS International Ltd. © 1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). PEN-PCC-9409

Circle 265 on reader service card.

John C. Dvorak

Déjà Gloom

It came right off the wire: A revised earnings forecast from Lotus. The operative word was *shortfall.* There were a lot of excuses. Earlier in the year, the superstores were moaning about a sales slowdown. Then Gateway 2000 announced its performance was disappointing and that profits were likely to be way off. Technology stocks were pounded by this and other bad news.

During any microprocessor transition (moving from the 286 to the 386, or from the 386 to the 486), there's usually a period of consolidation and the market hits a minislump. We already went through the minislump when the Pentium was introduced. So what's this new gloom about? If you read enough news reports, it seems the industry is about to go through a shakeout. Let's examine some of the reasons I think this will be terrible—especially for you, the user.

First, there has not been a substantial power increase in machines since the introduction of the 66MHz 486DX2, which has dominated the desktop for two years. The rule has been that you must double or triple performance to get the market excited. The 90MHz Pentium doesn't do this, and neither does the 100MHz DX4. This means people are loading up on cheap 66MHz DX2 machines during a price war that is costing manufacturers' profits.

Then there's something I call the Commodore 64 syndrome. In the early 1980s, Commodore and its pitchmen sold Commodore 64s into the home market by the boatload. The machines were not as easy to use as advertised, and not nearly as powerful as they should have been. Many people jokingly called them doorstops. They mostly ended up in closets, unused.

Now the new pitchmen are selling multimedia machines or multimedia kits, and again hoping to tap this perceived huge home market. The home market, per se, has never been proven conclusively to exist. There are home buyers, but they tend to be price-oriented, naive, and fickle. Hardly a market to count on. But the prices look right as 486s get dirt cheap.

Multimedia has all the earmarks of the Commodore 64 and some of the earmarks of the once-collapsed game market that knocked Atari out of the picture years ago. For one thing, as snappy as some multimedia CD-ROMs and programs seem to be, they don't always work as advertised. It's a huge pain to get sound boards to work. When a user has one sound card, such as a Sound Blaster, and wants to upgrade to something better, such as a Turtle Beach, the user discovers that the change is not trivial—and sometimes not even possible. When users have to set DMA channels and IRQs manually, then you can kiss the home market good-bye. We're going to be seeing a lot of computers in closets.

And what about CD-ROM titles? Are there enough drives and interest to sustain the product base? There are thousands of CD-ROMs in the pipeline. There's no infrastructure except direct mail to sell these discs. It's not like a Janet Jackson CD that can be distributed to thousands of "record" stores. There are no CD-ROM stores.

So when I read that GTE "spawns a new software unit" to develop CD-ROMs, or that telephone executive Bob Kavner joins Creative Artists Agency to help it get involved with digital interactive media, I have to ask myself, does this sound nuts or what?

These companies, with no experience in the computer business, will flood the market with crap. The shakeout in multimedia will be so terrible that it will take much of the already precarious computer scene with it. The dopey, overhyped pen-based computing fiasco and the Atari game collapse are the models for this one . . . only this will be bigger. The hopes for a killing from multimedia are higher than they've ever been for anything, ever. It's incredible. The trouble is, the people putting these deals together don't realize that what they're doing is based on flaky technologies. This stuff is not ready for prime time yet.

What's annoying is that the whole computer scene will be tarnished. Stories will appear in the *Wall Street Journal.* A know-nothing corporate president will say he was misled. Another will say the research was right but too many people got into the lake. Another will blame the market, saying her company got into it during a downturn. The excuses will be endless.

The negative news will affect the market for computers when consumers read/hear about it. Skittish home users will stall on buying computers. Because the big vendors are relying on a huge profit from this market, they will be stuck with inventory that will become worthless as technology moves to the next generation. These machines will have to be dumped at a loss. The buyers will, of course, end up putting them in the closet right next to . . . the Commodore 64 they bought 12 years ago.

Things don't change much in this business. Neither do the excuses.

MULTIMEDIA? *Remember what happened to* **ATARI . . .** *Don't forget the* **COMMODORE 64 . . .** *Terrible times lie ahead, especially* **FOR YOU,** *the end user.*

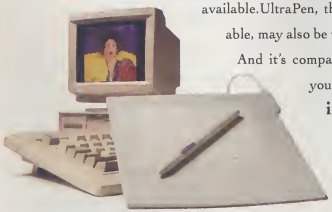
PHOTOGRAPH BY JAMES McGOON

BRING YOUR CRAYONS TO WORK.

ArtPad is a full-featured, high-performance graphics tablet that lets you draw, paint or just plain create, right on your computer.

The Wacom UltraPen

To anyone who's ever thought..."I'm gonna have to draw these guys a picture," here's your chance. From personalized memo's to flow charts to sketches, layouts and logos. Even annotated mail with your pen software. Introducing the Wacom **ArtPad.**™ It's a small and handy, but thoroughly professional graphics tablet from the maker of the world's most critically acclaimed and widely recognized tablets. ArtPad ships complete with the Wacom **UltraPen,**™ the only cordless, batteryless, **pressure-***sensitive* pen available. UltraPen, the most natural computer drawing tool available, may also be the *best way to navigate* on a computer. And it's compatible with just about everything. So, whether your speeding through a spreadsheet or just **adding impact** to *e-mail*, get the Wacom ArtPad. For when you just gotta color outside the lines. For more information on ArtPad or the names of authorized dealers nearest you, please call **1-800-922-6620** today.



Smaller than most mousepads, ArtPad measures only 6 x 7 inches. ArtPad is available in both Macintosh® and PC versions.

WACOM.®

Wacom is a registered trademark and ArtPad and UltraPen are trademarks of Wacom Co., Ltd. All other brand and product names are trademarks or registered trademarks of their respective holders. ©1994 Wacom Company, Ltd. All rights reserved.

Circle 111 on reader service card.

Gil Schwartz

THE V.FAST VP

Nowhere is the stunning paradigm shift away from substance and into communications for its own sake more dramatic than in the convergence between Vice President Al Gore and the electronic cause he so boldly champions. For those who don't, can't, or won't understand the beauty of the conceptual highway that lies ahead, the vice president is the clearest physical representation of the medium he is trying to create. In these ten important ways, he is the thing itself, and as we understand him, we understand it:

1. They're both very good looking and make a powerful first impression. Although the superhighway is significantly more wiry than the vice president, both are big and handsome, with attractive interfaces that draw you almost immediately into whatever hooey is transpiring. Even those who don't really want to like them end up shaking their heads in grudging admiration.

2. Both have a lot of information and aren't afraid to show it. Anyone who saw the VP take on Mr. Perot in the last election knows that he's capable of retaining gigabytes of data in his random access memory banks and core dumping the contents at will, amazing friends and influencing people all over the place.

3. They both represent a commitment to reinventing things. The vice president is on a mission to reinvent government. The electronic superhighway wants to reinvent the way we bank, shop, visit our imaginary neighbors, eat simulated breakfast, and make virtual love.

4. You have to be very smart to understand either of them. Like the superhighway, which will reward people who know how to access its many levels, the VP has a tendency to talk up—not down—to the public, assuming a certain level of technical sophistication on matters of great importance to us all. This can lead to some problems, since . . .

5. They both tend to wander off into unspeakable technobabble given half a chance. Getting backed into a corner at a party with Mr. Gore as he delves in to the arcana of telecommunications deregulation—or finding yourself in a digital data swamp alongside the I-Way after making an innocent query—is no fun for those with MTV attention spans.

6. They both make conservatives very angry. On the other side of society's spectrum from youngsters who find a 30-second commercial the intellectual equivalent of *War and Peace*, there are the tortoise-headed Luddites who hate anything new and reinventional. These individuals have a smarmy, condescending aversion both to the earnest, hard-working vice president and to the implications of the digital revolution, just as they despise all those laboring to replace existing institutions, technologies, jobs, belief systems, and people with theoretical ones.

Though MORE WIRY *than the vice president, the I-Way bears a* STRIKING RESEMBLANCE *to Mr. Gore . . . . Neither one gets the* LEAST BIT FUNKY *until well after dark.*

7. They're both very clean and morally impeccable, though. The superhighway will be as G-rated as a bucketful of raw transactional data, jammed full of squeaky infotainment and jolly bitmaps of faraway places. Like the veep, the superhighway won't get one bit funky until way after hours, and even then only when we consent.

8. And yet, they're both perceived by some to be relatively nonessential. At the same time, Mr. Gore, as vice president, and the superhighway, as a fictional construct, both suffer from the public perception that, were they to drop from existence altogether, nothing substantial would change. This has to do with the functions both now serve. One is vice president, heretofore a largely ceremonial position that has had little day-to-day impact on the workings of the Republic. The other is an almost wholly fanciful creation of futurists, hopeful investment bankers, and the *New York Times*. That's not very many people, although they are influential. But all that will change! Because . . .

9. They each show far more potential for greatness than they've yet delivered. There's nowhere to go but up for Mr. Gore and his superhighway. Both have shown they can achieve the heights of publicity, are willing to put forth tremendous ideas that can be neither proved nor disproved with great passion, and can build on existing infrastructures to create air castles of daunting proportions—blueprints of a tomorrow yet to come. That's right . . .

10. The future belongs to them both! And what a place it will be, too! A networked festival of services where information hovers just a micron from our fingertips all the time; where movies, music, shopping, and other stimuli are always on the window ledge, cooling; where earnest folks with pinstriped headgear serve up a virtual reality that does battle with the real thing and wins. And in the middle of it all, presiding with vision and good humor, look! It's President Wonk at his computer, at play in the fields of the Internet, interacting with the people, by the people, and for the people. Huzzah!

PHOTOGRAPH BY JAMES McGOON

Let's talk scanners.

AT MICROTEK, WE DON'T MAKE COMPUTERS AND WE DON'T MAKE

Whatever you buy a scanner for — document management, desktop publishing, high-end graphic arts — you want the best scanned image possible, the most advanced features and the highest value for your hard-earned dollar.

That's why people who know, pass up the "johnny-come-latelies" in the scanner business and go straight for the first name in scanners: Microtek.

A Reputation for Innovation.

While many of the names in today's scanner market were still making computers, laser printers...or even radios, of all things, Microtek was racking up an impressive array of firsts in scanners.

Microtek brought the first halftone desktop scanner to market in 1984. Microtek was also responsible for the first 256-tone grayscale scanner, the first affordable desktop color scanner and the first affordable 35mm slide scanner. With the recent introduction of Dynamic Color Rendition (DCR), Microtek produced the first automated color calibration and correction system. And now, with the ScanMaker III and ScanMaker 45t, we're the first to market with honest 36-bit desktop color scanners.

Affordable Quality.

Don't need color scanning capabilities? Then don't buy them. The Microtek ScanMaker IIG is a great 300 x 600 gray-scale scanner with a street price starting around $400.

Want color but still don't want to spend big bucks? Look into the ScanMaker II – you get 24-bit color flatbed scanning *and* Adobe Photoshop LE for around $550.

Looking for a fast, single-pass scanner for office and graphic applications? The ScanMaker IISP is the winner of two important Editors' Choice Awards from *PC Magazine* and from *Imaging* magazine. It has software enhanced resolution of up to 1200 x 1200 and a street price of around $750.

For more sophisticated applications, there's the ScanMaker IIHR. You'll get software enhanced resolution up to 2400 dpi — which makes it very popular with

Microtek's Family of Scanners includes: ScanMaker III, ScanMaker IIHR, (both shown with optional transparency adapter), ScanMaker 45t, ScanMaker IISP and ScanMaker II.

PRINTERS. ALL WE MAKE ARE THE BEST SCANNERS YOU CAN BUY.

PC MAGAZINE EDITORS' CHOICE February 8, 1994 Microtek ScanMaker 45P

IMAGING MAGAZINE EDITORS' CHOICE

graphic artists — and a price of around $1100, which makes it very popular, period.

68 BILLION COLORS.

With 36-bit color resolution, the ScanMaker III and ScanMaker 45t are working with far more data than any 24- or even 30-bit scanners. A palette of 68-billion colors means unparalleled richness and depth, clarity of detail and color accuracy that rivals machines costing much more.

The ScanMaker III is a fast, single-pass flatbed scanner with DCR color calibration, software enhanced resolution up to 2400 dpi and a street price under $2700.

You read it right, under $2700.

For real high-quality work, the ScanMaker 45t offers photographers and graphic artists up to 2000 x 2000 dpi software enhanced resolution for scanning transparent images up to 5" x 5". It costs about $6500 and offers a level of quality that – until now – was only available to professionals using costly drum scanners.

FIRST NAME IN VALUE.

No matter how much money you have to spend, you'll find your best value is with Microtek. For example, most Microtek scanners come with Adobe Photoshop or Adobe Photoshop LE at no extra cost.

Microtek is the world's largest desktop scanner manufacturer. We've made more scanners, longer, and have a history of more scanner awards and innovations than anyone else you can name. And since we don't divide our attention between computers, printers and miscellaneous consumer products, we can concentrate on making the finest products in the scanning business. For your free copy of our scanning primer *The Scanned Image*, more information about scanners and Microtek in particular, just call us at 800 654-4160 or fax a request to 310 297-5050.

MICROTEK

Better Images Through Innovation.

Before you buy a scanner, let's talk.
800 654-4160

The following are trademarks or registered trademarks of their respective companies. Microtek, ScanMaker and DCR (Dynamic Color Rendition) of Microtek Lab, Inc., Adobe Photoshop of Adobe Systems, Inc. Prices and software bundles are subject to change

Circle 186 on reader service card.

New! ProShare 200 vs. Vistium 1300

Being There—Sort Of

Have you heard about the miracle of videoconferencing? You know, the cutting-edge technology that's going to bring the world to your desktop, save you thousands of dollars in travel costs, salvage all those wasted hours you spend on planes, and make the traditional everyone-in-one-room meeting a thing of the past?

Don't turn your conference room into a cafeteria just yet. While Intel's ProShare Personal Conferencing Video System 200 and AT&T's Vistium Personal Video 1300 have a lot to offer, their video images are so jerky, distorted, and distracting that you really don't get the full range of facial and bodily cues that make face-to-face meetings useful. Furthermore, since these products are point-to-point only—at least for now—you can't "meet" with more than one person at a time.

But don't despair. The shared whiteboards and application-sharing capabilities that they offer more than make up for the disappointments of their video features. They'll make you soon forget about videoconferencing and embrace desktop collaboration as the real wave of the future.

Sublime and Ridiculous

Setting up a videoconferencing system, especially one that relies on the black art of ISDN, isn't trivial. But once the ISDN lines were in place, we found that installing Intel's ProShare, in particular, was practically painless, thanks to its clearly labeled hardware and excellent hand-holding documentation.

Installing the Vistium was not as easy. The documentation is close to being unreadable, and two of the three adapter boards are conjoined, which makes them hard to install.

Push-Button Interfaces

Both products are a cinch to use. ProShare's main screen consists of a phonelike panel with detachable local and remote video boxes, as well as buttons that let you launch all the features from a single screen. With the Vistium, you launch various features from the Vistium Manager.

While ProShare does support OLE—which means you can cut and paste an Excel spreadsheet, for example, into the shared whiteboard for both callers to annotate—Intel has eschewed existing industry standards for videoconferencing, which include the CCITT H.320 desktop standard and the CIF standard used for "conference room" videoconferencing products. The Vistium, on the other hand, will work with systems based on either standard.

The products' features are comparable, such as a phone book and a shared whiteboard. Both address books let you enter all the usual information,

OVERVIEW Face-to-Face

The Hard Part: Despite its two interface boards, the ProShare (right) is very easy to install. We wish we could say the same for the Vistium's bulky three-board setup (left).

No Surprises: ProShare's ease of use is evident in its control panel (left), which lets you launch all the program's features and access video controls. You can configure the Vistium Manager (above) to float onscreen during a conference and quickly launch a shared application or whiteboard session.

PHOTOGRAPH BY ARNOLD TOSKUJO

ProShare

USABILITY: *Best videoconferencing documentation we've seen.* ****
TECHNOLOGY: *Skimps on some features.* ***

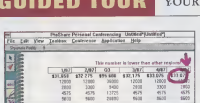
VERDICT: *Best choice for easy-to-use videoconferencing. We'd like to see more emphasis on desktop collaboration.* ***

Vistium

USABILITY: *It's a bear to install . . .* **
TECHNOLOGY: *. . . but we love the app sharing and sizable video windows.* ****

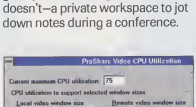
VERDICT: *Expensive but fully featured. Has the advantage of working with existing videoconferencing standards.* ***

GUIDED TOUR YOUR **DESKTOP** OR MINE?

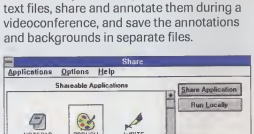


Private Time: While its annotation tools are somewhat clunky, ProShare's shared whiteboard gives you something the Vistium doesn't—a private workspace to jot down notes during a conference.

Markups: With the Vistium's shared whiteboard, you can import graphics and text files, share and annotate them during a videoconference, and save the annotations and backgrounds in separate files.



Picture Tuning: ProShare installs a Control Panel utility that gives you an easily accessible way to adjust the amount of your system's resources that you allot to video.



Program Sharing: Collaborative work is where these applications shine. To share applications with the Vistium (above), you simply add the application to a list. ProShare also lets you share, but it's more complicated.

FILEBOX

ProShare Personal Video System 200

Minimum Memory Requirement: 8MB.
Recommended System Requirements: 33MHz 486, 16MB RAM, 7MB free disk space.

$2,499
Intel
(800) 538-3373
Reader Service No. 611

Vistium Personal Video 1300

Minimum Memory Requirement: 8MB.
Recommended System Requirements: 33MHz 486, 16MB RAM, 10MB free disk space.

$4,995
AT&T
(800) 225-5627
Reader Service No. 612

plus you can include a snapshot with each person's entry. Their shared whiteboards let you import files, annotate them—remotely or locally—and save the markups. You can also share applications using either product, but this is easier to do with the Vistium, which, unlike ProShare, supports file transfer during a conference.

One area in which the ProShare is noticeably superior is in its diagnostics. During installation, it adds several diagnostic programs directly to your Windows Control Panel. Vistium's diagnostic programs are all DOS-based, and AT&T recommends that you exit Windows to run them, rather than executing them through a DOS box. Future versions should include Windows-based diagnostics, but until then it's a hassle to troubleshoot this system.

Bottom Line Speaking of trouble, don't try to run either system on a PC with less than 16MB of RAM. While both companies recommend at least a 486-based PC with 8MB, we found that we couldn't launch whiteboards or share files when we had the video running on an 8MB machine.

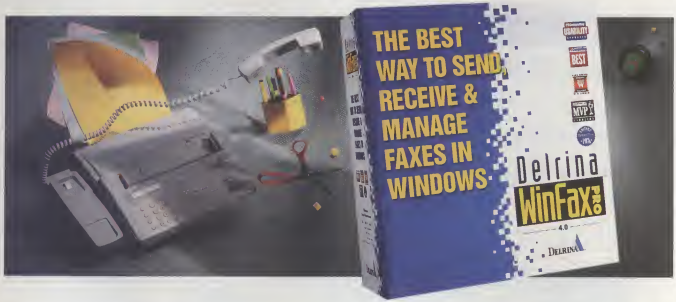
The per-seat cost of these products is still too high for us to recommend them for everyone. But if you regularly go off-site to collaborate on blueprints, reports, or any other kind of document, then the shared-desktop applications are sure-fire time-savers. If you can afford a full-blown videoconferencing package, great—mugging for the camera at the start of a virtual meeting is good for a few minutes of fun. Otherwise, both companies offer desktop-conferencing–only versions of these systems that to our minds give you far more mileage for your money. SHYAMALA REDDY

Guide to the Ratings

In each applicable area—usability, performance, technology, and verdict—a product is awarded a rating of one to five stars. Five stars are the best and one is the worst. In some cases, other factors (such as price) also affect a product's verdict.

***** **Excellent** A market leader that offers exceptional performance in this category.
**** **Good** Excels in a few areas; a good buy, though not perfect.
*** **Acceptable** Product is average for its class; a decent and justifiable purchase.
** **Poor** Out-of-date or substandard product, possibly offset by some positive features.
* **Unacceptable** Missing necessary features or suffering from subpar implementation; avoid.

Introducing Delrina WinFax PRO™ 4.0. You'll wonder how you ever faxed without it.



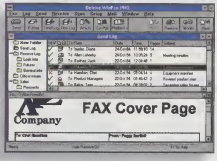
Meet the fastest, easiest, most convenient way ever to handle all your faxing – new Delrina WinFax PRO™ 4.0, the latest version of the best-selling fax software in the world. The only one that combines the advanced faxing features you need with astonishing new ease and usability.

"The best fax package there is."

That's what *PC/Computing* said about version 3.0. And now we've made it even better.

Starting with the revolutionary new streamlined interface that makes it simpler than ever to do anything you'd do with a fax machine, and a lot more. Like sending faxes directly from within any Windows application as easily as you'd print. Or organizing sent and received faxes in convenient folders. Or converting faxes into word processing documents with OCR.

There's added convenience with dozens of ready-to-use cover pages. Fax phonebooks that are drag-and-drop simple. And improved fax annotation tools that even let you add your signature.



Based on extensive usability testing, the new customizable interface includes folders for organizing sent and received faxes.

Don't try this with a fax machine.

Imagine faxing, not just an image of a document, but the actual file itself*, so it's ready to be used in an application. Imagine sending a single document that is automatically faxed to some people and e-mailed to others.

Now imagine you're on the road, and WinFax PRO automatically forwards faxes to you. Or lets you retrieve faxes sent to your regular fax number*. And there's more.

Get new Delrina WinFax PRO 4.0 today and put faxing where it really belongs – on your PC. Call now for information or to upgrade from WinFax PRO or WinFax LITE™. Or see your local dealer to upgrade immediately.

DELRINA
1-800-268-6082

WinFax, WinFax PRO, WinFax LITE and Delrina are trademarks of Delrina (Canada) Corporation. All other product names are trademarks of their respective owners. © 1994 Delrina (Canada) Corporation. All rights reserved.
*Requires Class 1 modem

Circle 167 on reader service card.

Xerox 4900 Color Laser

First Real Color Laser

USABILITY: *Easy to set up and configure.* ****
PERFORMANCE: *Prints at a rapid clip.* ****
TECHNOLOGY: *QMS was first, but Xerox is better.* ****
VERDICT: *A most impressive color laser.* ****½

Color laser printing is just starting to take off. The newest entrant—the Xerox 4900 Color Laser—bests the pioneering QMS ColorScript Laser 1000 with a lower price tag, faster color printing, and better-looking output. At last, color printing is now fast enough and inexpensive enough to fit into the workgroup

The Big Easy Color laser printers are big—and they have to be to hold four laser cartridges and the gear to run paper past them all. Despite its 108 pounds, the Xerox 4900 was easy to set up and calibrate. We did hit a stumbling block when we tried to print from the PCL5 driver, but dabbling with the cryptic front-panel menus solved that problem.

Need to print an EPS file in a hurry? Just insert a 3½-inch floppy disk into the Xerox 4900 and you can print the file without a computer. You can even set a number of options for the file you plan to print, such as quantity and media size.

The Xerox 4900 prints at a rapid clip. On our test files of a business presentation with text and graphics, it ran an average of 27 percent faster than the ColorScript. However, on documents with lots of text and only splashes of color, the Xerox 4900 was about 18 percent slower than the ColorScript.

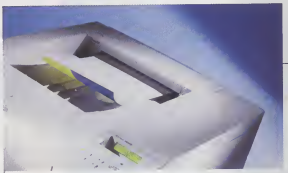
We ran all of our color tests using PostScript Level 2, and therein lies the main drawback of the Xerox 4900: Its PCL5 implementation doesn't support color extensions.

Actually, even running in PCL5, the Xerox 4900 is slower than its advertised speed of 12 pages per minute for printing black-and-white text. It was about 50 percent slower than our Hewlett-Packard LaserJet 4 Plus, a monochrome printer with a 12-page-per-minute engine.

While the Xerox 4900 might be just a bit slow to sit at the end of your network, it's a better solution for color text and graphics—in both quality and speed—than any other technology can offer at this point.

Looking Good The Xerox 4900's output is, in a word, dazzling. Support for resolutions up to 1,200 by 300 dpi (if you pay an extra $949 for the required extra RAM) makes for graphics output that has smooth, crisp colors. Even in its standard 300-dpi resolution, the colors are much more even than the ColorScript's.

Xerox may be first to market with a high-resolution color laser printer, but they won't be the last—QMS has just added a 600-by-600-dpi printer (the Magicolor) to its line. We'll test it in an upcoming issue. Until then, the Xerox 4900 sits at the top of a short list of fast, reasonably priced color laser printers. KYLA K. CARLSON



Ditherless Dots: The Xerox 4900 Color Laser's output in 1,200 by 300 dpi (right) is much smoother than the 300-by-300-dpi output of QMS's ColorScript Laser 1000 (left), where dithered patterns distract from the image.

Leapin' Lasers: Xerox has released a breakthrough color laser printer that offers outstanding output quality at a price that's significantly lower than its nearest competitor.

Faster—and Cheaper

Color at a Clip: The Xerox 4900 Color Laser printed our four-page presentation faster than the QMS ColorScript Laser 1000. Its speed for black-and-white text, however, was less than impressive, running 18 percent slower than the QMS printer.

FILEBOX

Xerox 4900 Color Laser

Resolution: Ranges from 300 by 300 dpi with standard 8MB of RAM to 600 by 300 dpi with 12MB of RAM and 1,200 by 300 dpi with 20MB of RAM.

RAM: 8MB standard, expandable to 48MB.

$8,495
Xerox
(800) 275-9376 ext. 984900
Reader Service No. 613

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD TOSELJO

Best Little Subnote We've Tested

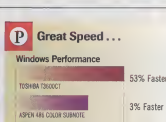
USABILITY: *None better at 4.4 pounds.* ★★★★★
PERFORMANCE: *Fast CPU, great batteries.* ★★★★★
TECHNOLOGY: *It's a pacesetter.* ★★★★★
VERDICT: *Expensive, but worth it.* ★★★★

Sure, we'll loan you our new 4.4-pound Toshiba Portégé T3600CT. Honest. Just as soon as you pry it from our cold, dead fingers. Until then, this baby travels with us everywhere—we're Portégé addicts. We didn't think it was possible, but we like the T3600CT even more than its little brother, the Portégé T3400CT.

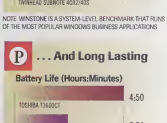
The best way to use the T3600CT: Store your next business presentation on the subnote, then borrow a 17-inch monitor for viewing it. The T3600CT becomes a 4.4-pound dog-and-pony show.

Usability is the quality that sets Toshiba's Portégé series apart. Keyboard layout and response are second only to IBM's ThinkPad 500. Toshiba licensed IBM's eraserhead pointing stick, but embedded two center-mounted concave mouse buttons on the 3-inch hand rest below the space bar, much like Apple's splendid PowerBook series. The result? The Portégé's pointing device is better than IBM's *and* Apple's.

Lovely Layout: Two mushroom-cap mouse buttons poised on the hand rest bring you the best from Apple's PowerBook series. Plus, an eraserhead pointer mimics IBM's excellent ThinkPad portables. The synergy of these designs works better than either of the two portables from which they're borrowed.



NOTE: WINSTONE IS A SYSTEM-LEVEL BENCHMARK THAT RUNS 12 OF THE MOST POPULAR WINDOWS BUSINESS APPLICATIONS



NOTE: ZIFF BATTERY RUNDOWN TEST MECHANICALLY SIMULATES KEYSTROKES

Nothing Faster: More than 50 percent faster than other subnotes? Yes, and with enough power to keep you working for nearly five hours.

Screaming Mini The T3600CT's performance may very well humble your desktop system, thanks to a 3.3-volt, 50MHz 486DX2 CPU and accelerated video on VESA local bus. In our Windows performance benchmark tests, it soared past the Twinhead Subnote 4DX2/40S, the previous speed leader. Although several vendors have announced similar Pentium-based 4-pound systems, scheduled to begin appearing early next year, the T3600CT is currently the fastest subnote you can buy.

Add to that raw power a speedy 250MB hard drive (the T3400CT comes with 120MB) and 8MB of RAM (expandable to 24MB), and you've got all the muscle you need to build presentations and work with beefy graphics files—on airplane tray tables, if necessary.

Best of all, you won't go blind doing so. The 8.4-inch color display (256 colors at 640-by-480-pixel resolution) keeps up with the CPU and graphics accelerator, thanks to the rapid response of active-matrix technology. It makes the T3400CT's 7.8-inch display, which we thought was dazzling when we first saw it, look downright dinky. The colors are bright and richly saturated. Other subnote makers, please take note: Color makes tiny displays usable when working in a graphical environment.

The list of goodies goes on: Lithium-ion batteries provide almost five hours of life. There's one Type II PCMCIA slot. A standard serial port is included, as is a parallel port that doubles as the interface for the external floppy drive. There's also an RGB port for an external monitor. Finally, there's a 72-pin bus connector to attach a $239 port replicator, which makes desktop operations easier.

Price Check Is leading-edge technology of the sort we've described beginning to sound too good to be true? The subnote's suggested price provides a grim reality check: $4,799. At more than twice the cost of other subnotes, the T3600CT competes price-wise with the full-sized 7-pound notebooks that stretch the arms of road warriors today. In its weight class, the T3600CT simply has no competition. For high performance and long battery life in a truly portable computer, it's the best machine available. MARTY JEROME

FILEBOX

Portégé T3600CT

Configuration Tested: 8MB RAM, 250MB hard drive.

Weight: 4.4 pounds.

$4,799
Toshiba America Information Systems
(800) 334-3445
Reader Service No. 614

PHOTOGRAPH BY ARNOLD TIOSEJO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

With CORELSCSI™ you don't have to wait for "Plug and Play."

CorelSCSI offers you these "Plug and Play" capabilities:

- Makes peripheral installation and configuration automatic and user-friendly.*
- CorelSCSI will react to any changes in the hardware configuration and will automatically load and unload device drivers. New devices install themselves. All you have to do is restart your system.
- Automatically configures the appropriate device drivers for scanners, CD-ROM, optical, and tape drives.
- Provides you with a wealth of detailed information about your host adapter, devices, and operating system.

*Device ID numbers and termination must be set manually.

In addition:

- Connect up to 7 devices to a single host adapter.
- Features device drivers for virtually every SCSI device including printers, scanners, CD-ROM drives, CD-writers, optical drives, tape drives, hard drives, and PC notebooks.
- Also includes other useful utilities such as CD-Audio, WAV File Editor, System Browser, PCD Conversion Utility, Screen Saver, and Wallpaper Flipper utilities.

CORELSCSI™ APPROVED PRODUCT
Ask for our free monthly Approved Product List

No need to purchase new hardware! CorelSCSI is certified to work with more than 300 existing devices and over 80 host adapters, and includes ASPI drivers for over 30 popular host adapters.

COMPUTER City™ 1-800-THE CITY 1-800-843-2489

Now only $89.95*

Call for the store nearest you or to place an order

*U.S.$ plus applicable taxes.

COREL ext.28 1-613-728-3733

KUR.0073

Circle 200 on reader service card.

Good Price, Not-So-Good Color

USABILITY: *Not nearly as user-friendly as its competitors.* **
PERFORMANCE: *Fast, but colors tend to be oversaturated.* ***
TECHNOLOGY: *Low-end technology means trade-offs.* ***
VERDICT: *Price isn't everything. This printer doesn't measure up.* **

Color ink-jet printers are a game of give and take. The give is their low up-front cost. The take is output quality that's not always top-notch and potentially costly consumables that need to be replaced often.

Texas Instruments' new microMarc Color Inkjet is a perfect example. It's a decent printer with a low price. Its black-and-white print speed and quality are good—however, its color performance is not. You get what you pay for.

Bumpy Ride The typical demands placed on a low-priced ink-jet printer are not complex. You set it up, print, then print some more. Setting up the microMarc was fairly easy, but if you run into problems, you can't turn to the manual for help. It's heavy on technical jabber and low on practical advice.

More importantly, in day-to-day use the microMarc asks for too much user intervention. For example, every time you change between the black and three-color cartridges, you need to flick a corresponding switch inside the printer. If you don't, you're stuck with unsatisfactory printouts.

We had a few problems with our microMarc driver. In a presentation graphics application, the slides did not print within the correct margins. Curiously, when we substituted a Hewlett-Packard DeskJet 500C driver, the four-page presentation printed flawlessly, albeit about a minute slower.

The microMarc's output is adequate. The colors, while vibrant, were a bit too bright. In a chart where bars should have been red, our output was magenta, and other colors such as blue and green should have been more subdued. Monochrome output with the black cartridge is OK—slightly fuzzy text, but rich blacks.

Black-and-white print speed is impressive compared to the DeskJet 500C, so if you plan to do lots of black-and-white printing and don't have high standards for output quality, this printer may suffice.

Take the Low Road The microMarc fits into the lower end of the ink-jet market. You pay a rock-bottom price, but there are trade-offs. The most significant is that you must choose between monochrome printing or color printing with a composite black (using all three colors to make black). The trade-off with color printing is that you end up using all of your colors to make black, which results in a shorter color cartridge life. If you're going to print a long business document with one or two color charts, this is not the most cost-effective solution.

You'll also find that the quality of composite blacks isn't as high as true blacks. If you're printing text documents in black mode, you'll have better quality blacks without draining the color cartridge.

When it comes down to it, price is all that's special about the TI microMarc Color Inkjet. Output quality is adequate for both color and black and white, and speed is marginally faster than the competition. But price alone isn't enough justification to buy this printer. If you do a lot of black-and-white work, it will serve you well. But if you're looking for superior color printouts and an easy-to-use product, you're better off spending about $250 more for higher-end ink jets such as HP's DeskJet 560C or Canon's BJC-600. KYLA K. CARLSON

Points for Price: The best features of the TI microMarc Color Inkjet printer are its sleek design and its $439 list price. The microMarc's performance is solid, but output quality falls short—especially color output. If you have high standards, you're better off spending more money up front for a DeskJet.

Graphics Performance

The Quality Conundrum: The microMarc's color print speeds were faster than the DeskJet's, but its output quality wasn't quite as impressive.

FILEBOX

microMarc Color Inkjet

Competitors: HP DeskJet 500C ($485) and DECcolorwriter 520ic ($449).

Resolution: 600 by 300 dpi for black text with resident fonts, 300 by 300 dpi for all other printing.

Ink Cartridge Costs: $38 for color; $29 for monochrome printhead (including one ink cartridge), $22 for two monochrome ink cartridges.

Ink Cartridge Life: 200 pages for color, 300 pages for monochrome.

$439
Texas Instruments
(800) 848-3927
Reader Service No. 615

Guide to the Ratings: *****Excellent ****Good ***Acceptable **Poor *Unacceptable

PHOTOGRAPH BY ARNOLD TIOSELID

Samsung
A new point of view.

SyncMaster 17GLs

It's about how you work...Attitude. Satisfaction. Pride. The 17-inch SyncMaster™ monitors reflect today's changing lifestyles. Hassle-free. Value-oriented.

Samsung took for granted you wanted bright, crisp clear images that don't flicker. You're also concerned about safety and energy conservation, so they're standard on the whole series. Life should be as simple as possible, so we added innovative new features like On-Screen Display and Real Color Control, and as you would expect, the GL Series comes with a two-year limited warranty.

Think about how you view your work. Samsung did. And came up with a whole new point of view.

TECHNOLOGY THAT WORKS FOR LIFE

For additional information, call 1-800-933-4110.

SAMSUNG ELECTRONICS

Circle 138 on reader service card.

SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	.28	.28	.28	.26
Maximum Resolution	1024 x 768	1024 x 768	1280 x 1024	1600 x 1280
Maximum Refresh Rate at Maximum Res. (Hz)	76	76	60	60
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

*1994 Samsung Electronics America Inc. The EPA Energy Star logo is not to be considered a product endorsement. Image on SyncMaster 17GLs courtesy of Mike Dixon Design Office

USABILITY: *The software suite's a breeze and installation is no problem.* ****
TECHNOLOGY: *Strong software, tight integration, 400-dpi grayscale hand scanner.* ***
VERDICT: *All-in-one scanning at a low, low price.* ****

The Swiss Army Knife of Scanning

Hand scanners are fun, but not very practical, right? Guess again. Caere's OmniScan combines a hand scanner with three soul mates—OCR, business-card recognition, and fax software—to create a winning package that has real business value. To top it off, there's an image editing program for more artistic projects.

The components that make up the OmniScan package are so well integrated with each other and with other Windows applications that using them is almost second nature. Need to fax a letter, complete with scanned logos, signatures, and handwritten notes? It's almost as simple as printing.

Throughout the package, Caere's careful attention to integration and interface has produced an array of features that are easy to use without sacrificing performance.

Piecing It All Together

Installing OmniScan's 400-dpi grayscale hand scanner may require a working knowledge of IRQs, but it's not as painful as you might expect it to be. And while it's easier to tackle large-sized scanning jobs with a flatbed scanner, OmniScan's smart stitching of multiple scans enables you to scan large images and full pages of text.

The fax software is that rarest of creatures: FaxMaster is a fax program that's actually easier to use than the fax machine down the hall. It packs a wide range of options, such as automatic OCR of incoming faxes, image compression, a thumbnail catalog of sent and received faxes, and customizable cover pages. FaxMaster isn't suited for heavy-duty fax-modem tasks: The distribution lists it creates are somewhat inflexible and awkward. But for occasional faxing, it's hard to beat.

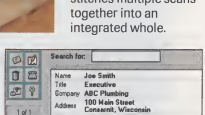
Not Just the Fax Caere's powerful but unintimidating OCR program, OmniPage Direct, works on files that have been scanned in or received through a fax modem. But in the version we tested, recognition proved to be spotty—its OCR on low-resolution faxes was especially frustrating. Assuming that Caere upgrades OmniPage Direct's recognition engine to the one in OmniPage 5.0, we anticipate the recognition rates will improve. (See "The Strong, Silent Typists," on page 92 for a review of the most current OmniPage version.) Typically, however, we've found that hand-scanned OCR trails flatbed-scanned recognition—it's a question of how evenly the source material can be scanned—so don't expect exact parity in results. OmniScan's bundled software (which is delivered after registration) also includes Corex Technologies' CardScan, a neat way to process business cards.

Finally, OmniScan includes Image Assistant GS, a grayscale image editing program for touching up scanned images. It's no substitute for a full-featured photo edition, but it has all you need to improve the quality of most scanned images.

If you've been looking for a good business reason to get that hand scanner you've always wanted, look no further. DYLAN TWENEY

Palm of Your Hand: Sure, the 400-dpi, 8-bit grayscale hand scanner that's the hub of the OmniScan package has its limitations, but it's still a usable package. Once you've installed the card (which may involve wrestling with IRQs), the limited width of the scanning window shouldn't get in your way: The software stitches multiple scans together into an integrated whole.

Here's My Card: The Corex scanning software, with its Rolodex-style interface, may look low-end but it packs a fair amount of muscle. Instead of struggling with Boolean operators to find that crucial contact, use its free-form search engine—enter any part of a word, and it searches every field until it finds likely suspects.



FILEBOX

OmniScan

Hardware: 400-dpi grayscale hand scanner, 16-bit ISA interface card.

Software: OmniPage Direct OCR software, Image Assistant GS grayscale image editor, FaxMaster fax software, CardScan business card recognition, front-end button bar.

System Requirements: 386 or better, 4MB of RAM, 8MB on hard disk.

$239
Caere Corp.
(800) 535-7226, (408) 395-7000
Reader Service No. 616

PHOTOGRAPH BY CHRISTINE ALCONO

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

HOP ON!

IF YOU'RE NOT USING CANVAS™... YOU'RE MISSING OUT.

When the rubber hits the road, you can't afford to spin your wheels using yesterday's under-powered graphics software. You need drawing tools designed for today's high-tech tasks. Tools that deliver unrivaled speed and accuracy without inhibitions. That's Canvas for Windows.

Canvas fuses precision drawing, page layout, text handling, boardroom presentations and painting features in one easy-to-master application. Enjoy your work and become more productive with just the right combination of tools to break away from the pack. Without sacrificing quality or compromising your creativity.

Canvas for Windows has taken the graphics industry by storm. If you haven't heard the thunder, it's time you did.

DON'T LISTEN TO US.

Listen to the 400,000+ high-tech professionals worldwide who power up Canvas every day in seven languages to produce today's top technical illustrations. Listen to the thousands of expert analysts from leading multinational corporations, government agencies and top educational institutions who have chosen Canvas as their graphics standard. Listen to computer experts at leading industry publications. They'll tell you that Canvas is the most advanced, cost-effective graphics solution. Period.

WE WON'T BORE YOU WITH THE DETAILS.

Needless to say, Canvas for Windows has all the drawing tools and features you'll probably ever need. From freehand Bézier curves to 1/65,000th-inch precision. From 15 flavors of auto-dimensioning tools to built-in color separations. From 24-bit color painting to 20 industry-standard import/export tools, including CDR, DRW and DXF. And thanks to our unique Open Architecture Technology (OAT™*), there's plenty of raw power available and even more when you need it. As proof, let us point out that every detail of this ad was created and color separated within Canvas for Windows.

DON'T MISS OUT ANY LONGER.

Stop grinding your gears with old technology. Quit wasting valuable time and energy with outdated graphics tools. Dust off your leather jacket, put on your baddest shades, then visit your favorite Canvas reseller today. Or call 1-800-733-6322 to order, and hop on for the ride of your life. Helmet not included.

CANVAS

THE HIGH-PERFORMANCE DRAWING ENVIRONMENT

WINDOWS Macintosh

MONEY BACK GUARANTEE 30 DAY

$99.95 COMPETITIVE UPGRADE

Still using some other graphics program? Now we've made switching to Canvas even easier! Keep their clip art, but trade in that scooter for some real precision drawing power. Simply show your dealer proof of ownership of any Windows-based graphics program and chop nearly $200 off Canvas' already low $599 price!

GENERAL SOFTWARE 7400 S.W. 87th Avenue, Miami, Florida 33173 • Tel (305) 596-5644 • Fax (305) 273-9069

*Even more by the time you read this! Major credit cards accepted. Add $10 shipping in the US and $15 in Canada. Call for shipping costs elsewhere

**1994 Dennis Systems, Inc. Canvas is a trademark of Dennis Software. Windows is a trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Inc. OAT's are good for you. Offer valid in the United States and Canada and is subject to termination or change without notice. This offer is not valid with any other promotion or offer.

Circle 175 on reader service card.

Pentium Punch, without Premium Price

Close only counts in horseshoes, hand grenades, and desktop PCs. Thanks to Intel's new 100MHz DX4 CPU, you can get blazingly fast computers—close to the speed of a Pentium system—for less dough than the already-cheap Pentiums.

Hewlett-Packard's HP Vectra VL2 4/100 and Polywell Computers' Poly DX4-100C are no slouches in the speed department, and you can get either of these systems out of the box for just about $3,000 (although the HP Vectra VL2 4/100 comes without a monitor). Either one could save you between $500 and $1,000 over a Pentium, depending on the configuration. And if don't want to give up that Pentium security blanket, you can rest assured—both of these systems are upgradable to the Pentium chip.

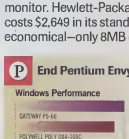
Vectra's Vision The HP Vectra VL2 4/100 is the first desktop system to make it into our labs that supports the Plug-and-Play BIOS. What does that mean for you? This system is Chicago-ready: Just plug in that new CD-ROM drive or sound card, and your system will take care of the nitty-gritty technical details for you.

The slim $2,649 HP Vectra VL2 4/100 comes standard with 8MB of RAM (we configured our test model with 16MB, which raised the price to $3,128), a Conners 340MB hard drive, 256K cache, and a 3.5-inch floppy drive. Your graphics needs will be satisfied with a 1MB dynamic RAM (DRAM), 1,280-by-1,024-pixel resolution Cirrus Logic 5428 local-bus graphics adapter.

Polly Want a PC? The Polywell Poly DX4-100C, at $2,850, comes standard with 16MB of RAM—plenty for running Windows. If you're so inclined, you can boost its system-board memory to 64MB. In addition, the Poly DX4-100C comes with a Western Digital 420MB hard drive, a Tyan local-bus IDE card, 256K cache, a 3.5-inch floppy drive, Orchid's Kelvin 64 VLB card with 1MB of DRAM, and a 14-inch Super-VGA monitor.

Both systems churned out lightning-fast numbers on our benchmark tests. In fact, their speeds were nearly identical. But when it comes right down to it, the HP Vectra VL2 4/100 is too expensive—it has no local-bus slots, and you'll need to buy your monitor separately. Also, the slim design means that monkeying around with its components can be a tricky proposition—there's not much room to maneuver. The cost might be worth it for the convenience of Plug and Play, but Polywell's Poly DX4-100C, with its large hard drive, 14-inch monitor, and roomy tower design, offers the better combination of price and performance. BOB BAYLEY

Attention Bargain Shoppers: Polywell's Poly DX4-100C (right) is a bargain at less than $3,000—including 16MB of RAM and a 14-inch Super VGA monitor. Hewlett-Packard's HP Vectra VL2 4/100 (left) costs $2,649 in its standard configuration, but it's less economical—only 8MB of RAM and no monitor.



Dazzling DX4s: The systems from HP and Polywell blew the doors off our 66MHz DX2 system, clocking speeds that were barely slower than Pentiums.

HP Vectra VL2 4/100

PERFORMANCE: *Not a Pentium, but close.* ****
TECHNOLOGY: *First Plug-and-Play desktop.* ****½
VERDICT: *High price.* ***

Poly DX4-100C

PERFORMANCE: *Pushing the Pentium envelope.* ****
TECHNOLOGY: *Decent features.* ***
VERDICT: *Great price.* ****

FILEBOX

HP Vectra VL2 4/100

Expansion: Four full-length ISA expansion slots, but no available drive bays.

Warranties: Three-year warranty, one year onsite.

Bonus: Upgradable ZIF socket for Pentium processor, supports Plug-and-Play BIOS so you can plug in compatible Plug-and-Play devices.

$3,128
Hewlett-Packard
(800) 752-0900
Reader Service No. 616

Poly DX4-100C

Expansion: Three VESA local-bus slots, five ISA expansion slots, a total of eight drive bays.

Warranties: Five years for labor and two years for standard parts, optional one-year onsite coverage available for $75.

Bonus: Price includes 14-inch SuperVGA monitor, 16MB of RAM (expandable to 64MB), 420MB hard drive, upgradable ZIF socket for Pentium processor.

$2,850
Polywell Computers
(800) 999-1278, (415) 583-7222
Reader Service No. 617

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD TOSKELIO

FIRST YOU GAVE US A DESK.

Now We Want To Ru

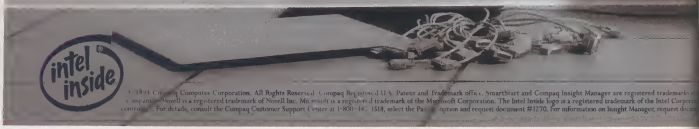
At Compaq, we know how much your people rely on information. After all, we've been working in your office for years. We also know that you're very serious about finding better and more efficient ways to handle information on a company-wide scale.

So, as your trusted PC company, we'd like to refer you to a solid, aggressive systems company: Compaq.

You may not be aware, but last year we provided over 63% of the world's superservers.[1] That's because our advanced systems can actually outperform mini-computers costing many times more, while delivering enterprise-class reliability. They can also radically cut per-transaction and maintenance costs.

Our experience, fueled by partnerships with such networking leaders as Novell, Microsoft and SCO, has helped us develop an integrated family of networking products – from the new ProSignia VS (which offers true server functionality at a desktop price) to the high-availability ProLiant line.

These systems can easily run today's emerging business-critical applications. They also reflect some refreshing common sense: Namely, there's no reason to downsize from big, complicated computers if you're



© 1994 Compaq Computer Corporation. All Rights Reserved. Compaq Registered U.S. Patent and Trademark office. SmartStart and Compaq Insight Manager are registered trademarks of Compaq Computer Novell is a registered trademark of Novell Inc. Microsoft is a registered trademark of the Microsoft Corporation. The Intel Inside logo is a registered trademark of the Intel Corporation. For details, consult the Compaq Customer Support Center at 1-800-347-1518, select the Pa option and request document #1270. For information on Insight Manager, request docu

THE WHOLE COMPANY.

going to end up with small, complicated computers.

So Compaq's networking solutions bring you the same ease of use we've brought to the desktop. Our CD-based SmartStart technology vastly simplifies the most complicated part of the setup process – reliably configuring and fully optimizing your system.

Our servers are built to keep running, even when being serviced. The Compaq Insight Manager monitors 800 critical measurements of server health, and our Pre-Failure Warranty[2] ensures free replacement of key parts before potential problems turn into real ones.

And since you'd rather not use your business as a test lab, we use our test lab as a test lab. Here, in real life, high-volume networks, we work with our industry partners to ensure the highest compatibility and keep our commitment to open systems. So you'll never be boxed in, forced to deal with any one manufacturer.

If you're interested in receiving specifications for Compaq systems immediately via fax, all you have to do is call us at 1-800-345-1518, choose the free PaqFax option and request documents #4001 and #4003. And if you think we worked hard at [illegible] you see what we do for you n[illegible]

COMPAQ

[illegible] are trademarks of [illegible] Compaq Computer Corporation. Product names [illegible] and/or registered [illegible] Requires Compaq Insight Manager 2.X and applicable only to advanced ECC [illegible] and disk drives [illegible] under Compaq [illegible] request the product catalog.

Circle 148 on reader service card.

Rich Color Scanners, Rich Prices

What's the best color worth to you? If you need perfect, true reproductions of color photographs for quarterly reports or other high-end output, would you pay a couple extra thousand dollars to leave the world of 24-bit, 16 million–color scanners behind? If so, check out Microtek's ScanMaker III and Umax's PowerLook—both of which read in billions of colors at resolutions up to 1,200 dpi in a single pass and sell for less than $3,500.

These scanners were not created equal—but both have their strong points. Microtek's newest ScanMaker reads in 36 bits of color, whereas Umax's tops out at 30 bits. For the same list price, Umax throws in a transparency scanning unit—an extra that will cost Microtek customers another $700. But both ship with SCSI II interfaces, Adobe Photoshop, and TWAIN scanning software to drop images directly into Photoshop.

Can You Spare 6 Bits? You can't knock their 24-bit scanners, but Umax's 30-bit scanner (right) and Microtek's 36-bit scanner (left) are in a different league. For photo-quality work, those extra few billion colors make a world of difference.

No Pain, No Gain The software offerings bundled with the ScanMaker III are as showy as the scanner's bit depth. The balloon help that pops up when you pause over controls in the scanning software is a nice usability touch. And in addition to the regular TWAIN scanning software, Microtek throws a color-lookup calibration system called Dynamic Color Rendition (DCR) into the ScanMaker III bundle. The calibration process is simple, at least in theory. Every month, you scan a color chart using DCR, then wait while the software matches color values to its database and adjusts the TWAIN module's settings to compensate for any differences. By the time you read this, Umax will be shipping similar software with the PowerLook.

We did, however, encounter problems running the calibration software, which was sensitive to skewed placement on the scan bed. But if you can withstand the pitfalls, you'll be rewarded with sharp, well-defined color images. If you're displaying your scans on color laser printouts, a monitor, or certain dye-sublimation printers, the level of color accuracy won't seem significantly better than 24-bit scans. But if you're scanning images—especially photos—for Scitex-style high-resolution, high-color output, it's clearly ahead.

Take It to Umax The Umax PowerLook is your best bet for quick installation and speedy scanning (using color photographs scanned at 300 dpi). Its MagicScan software has smart features and button bars that pep up overall usability—such as one-click removal of moiré patterns during the scanning process and a tool for distributing areas of highlight and shadow more evenly (a kind of digital burning and dodging).

Although the PowerLook surpasses the ScanMaker III in ease of installation and speed, it lacks the ScanMaker III's clarity and richness of color. While there's no doubt it produces top-notch color images, the PowerLook results don't quite match the ScanMaker III's. Those extra billions of colors between 30 bit and 36 bit make all the difference in really high-resolution output.

You don't want either scanner for OCR input or LaserJet output. But if you're the type to name your kids Scitex and Leaf, you won't want to be without one of them: the PowerLook for speed and ready-to-run features, the ScanMaker III for easy maintenance of color balance. LIESL LA GRANGE

ScanMaker III

USABILITY: *Software's balloon help racks up the points.* ****

TECHNOLOGY: *Scanner calibration software is a real winner.* ****

VERDICT: *Brings out true colors with 32-bit scans.* ***

PowerLook

USABILITY: *More icon-driven prescanning features, easy moiré removal.* ***

TECHNOLOGY: *Lower color depth than ScanMaker III, but faster.* ***

VERDICT: *Good price for the features, includes transparency scanner.* ***

FILEBOX

ScanMaker III

Expansion: Transparency adapter ($699), document feeder ($499).

Bundled Software: Adobe Photoshop, DCR calibration and correction software, TWAIN-compliant scanning module.

Specs: 36-bit color scans, 600-by-1,200-dpi true resolution, 2,400-dpi interpolated resolution.

$3,499
Microtek Lab
(800) 654-4160, (310) 297-5000
Reader Service No. 618

PowerLook

Expansion: Transparency adapter built in.

Bundled Software: Adobe Photoshop, MagicScan TWAIN module; color-lookup calibration system expected by press time.

Specs: 30-bit color scans, 600-by-1,200-dpi true resolution, 2,400-dpi interpolated resolution.

$3,495
Umax Technologies
(800) 562-031, (510) 651-9488
Reader Service No. 619

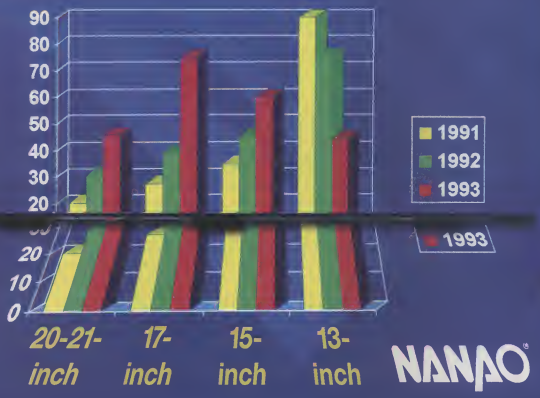
PHOTOGRAPH BY ARNOLD TIOSEJO

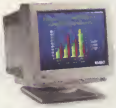
Guide to the Ratings: *****Excellent* ****Good* ***Acceptable* **Poor* *Unacceptable*

NANAO USA CO

Now what you see is what you print.

r Monitors in vironment





Nanao has something you've been waiting for: WYSIWYP. We're the first monitor manufacturer to include new Colorific™ color management software free with our 17" or larger FlexScan® professional display monitors. With easy-to-use, set-and-forget Colorific, you can print graphs, presentations, transparencies and other business documents – the first time – in the colors you actually see on the screen. Just think what this means: output color accuracy. Time savings. Reductions in trial-and-error draft printing. No more surprises. Colorific is the first software-only color calibration system that replaces add-on hardware solutions costing from $300 to $1,000. And it's available today. Once again, Nanao continues a tradition of industry innovations. Our award-winning FlexScan family of monitors are renowned for ultra high resolution, sharp edge-to-edge focus, energy-saving features and high product reliability. Now we're adding one more breakthrough to the list: WYSIWYP with Colorific.**

INCLUDING DOMMETTEK'S colorific

KODAK

NANAO®

Superior In Every Detail

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679
1-800-800-5202

*3 Year Warranty**

*Superior In Every Detail is a registered trademark of Nanao Corporation. All product names are trademarks of their respective companies. ©1994 Nanao USA Corporation. *3 year on P & L. 1 year on CRT. **Actual printout may vary. Colorific provides nearest possible match of output.*

Circle 212 on reader service card.

This is a busi

software prog

Do not

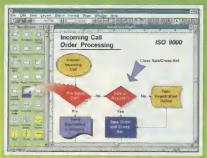
Rep

Do not b

Root canals. Bad haircuts. Business graphics. A few scary things you go through life trying to avoid. Well, fret no more friend. Visio™ is here. It's graphics software that gives you the courage to do things you've never done before. In a nutshell, it's business drawing for people whose business isn't drawing. What your spreadsheet does for numbers, Visio does for visual communication. With 20 stencils and over 600 pre-drawn SmartShapes™ to choose from, you'll be drawing all kinds of stuff without drawing one darn thing. Organizational charts. Project timelines. Computer network diagrams. Engineering schematics. The big word here is ENABLING. No other business graphics program lets you do so much, so fast

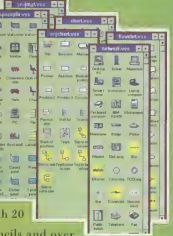
ness graphics

ram.



So you don't have a degree in rocket science? Using Visio is cake. Drag the pre-drawn SmartShapes from stencil to page. (In technical terms: Drag. Drop. Done.)

All trademarks referenced herein are held by Shapeware Corp. except for Windows which is a trademark of Microsoft Corp. ©1994 Shapeware Corporation. All rights reserved.



be afraid.

Visio and your Windows™ software. The perfect marriage. Visio has leading edge support for the OLE 2.0 standard. Which means you can put visuals into presentations, reports, spreadsheets, memos, and other office documents. It's a beautiful thing.

eat.

With 20 stencils and over 600 SmartShapes, you can draw project timelines, you can draw flowcharts, you can even draw maps. You can draw, draw, draw till it hurts.

e afraid.

and with such reckless abandon. Drag it. Drop it. You got it. The moral of the story? Floss daily, spend a little extra on your next haircut and get Visio.

Order today. Call (800) 457-3335, ext. C23 and get Visio for a mere $129. There's no better way to try Visio than to load it up and take it for a spin. Our 60-day money-back offer guarantees you'll love it.

Business drawing for people whose business isn't drawing.™

New! HARDWARE: ThinkPad 755C

Recipe for the Perfect Notebook

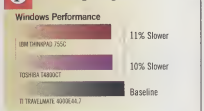
Nothing in life is perfect. Or is it? Consider IBM's new color notebook, the ThinkPad 755C. For starters, it boasts a blisteringly fast 75MHz clock-tripled DX4 processor, a luscious 10.4-inch active-matrix color display, and an optional Texas-sized 540MB hard drive. Despite this speed and display, the ThinkPad 755C's onboard batteries powered it through nearly four hours of our real-world testing. What's not to like?

Life at 75MHz is addictive, especially because IBM coupled the CPU with a fast video subsystem. To upgrade, pop up the keyboard and you can replace the CPU or RAM in minutes. And the 755C has a built-in microphone, perfect for annotating documents (and using up that hard-disk space you spent all your money on). The sound output capabilities (with Windows drivers) wisely remain unchanged from the older ThinkPad 750C.

Same Look, Longer Lasting: The ThinkPad 755C has an impressive 3 hours and 54 minutes of battery life.

Fast Enough: It's not the fastest, but the ThinkPad 755C still turned in impressive Windows performance compared to other 75MHz portables.

In the Big Leagues



Pricing wasn't available at press time, but we estimate that a 755C with 8MB of RAM and a 540MB hard drive should cost just less than $5,500 on the street; the DX2 model with a 340MB hard drive should cost $4,699. If you can afford it, pick up a 755C. MARTY JEROME

USABILITY: *Convenience-store upgrades—quick and easy CPU, RAM swaps.* ****
PERFORMANCE: *Show-stopping speed, impressive battery life.* ****½
TECHNOLOGY: *Sound, video, and a DX4 CPU.* ****½
VERDICT: *Near perfect in all respects; an excellent desktop replacement or traveling presentation machine, if your wallet can stand it.* ****

FILEBOX

ThinkPad 755C

CPU: 75MHz clock-tripled 486 DX4.
RAM: 8MB.
Hard Drive: 340MB or 540MB.
Display: Active- or passive-matrix color.
PCMCIA: Two Type II slots.

Less than $5,500 for the active-matrix version; $4,699 for the passive-matrix version (all prices estimated)
IBM
(800) 772-2227, (914) 766-1900
Reader Service No. 620

Hewlett-Packard 200LX

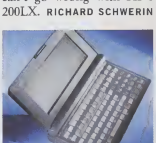
A Palmtop That Makes Cents

Hewlett-Packard's new 200LX looks and works a lot like the 100LX palmtop it replaces, but it includes one big bonus: a preloaded version of Intuit's Pocket Quicken. And like the 100LX, the 200LX includes a junior version of Lotus 1-2-3 and a cc:Mail reader as well.

With Pocket Quicken, you can enter and edit transactions in checking, savings, credit card, and cash accounts; review balances and registers for these accounts; and create and print basic reports. Pocket Quicken is especially useful for tackling business expense reports. And with the handy Connectivity Kit, your Pocket Quicken data can be merged with your desktop Quicken quickly and easily.

HP has made a number of enhancements to the 200LX's Connectivity Kit, including a built-in version of LapLink Remote Access, which provides access to the 200LX drives from within desktop applications. HP has made the translation, merging, and synchronizing of large files easy.

Best of all, HP is introducing the 200LX with 2MB of RAM for $699, $50 less than the previous version. A 1MB version lists for $549. For palm-sized portable e-mail, spreadsheet, and financial power, at these prices you can't go wrong with HP's 200LX. RICHARD SCHWERIN



Cash and Carry: The 200LX includes Pocket Quicken.

USABILITY: *Retains 100LX's nifty layout.* ***
TECHNOLOGY: *A must-have with lots of features for corporate nomads.* ****
VERDICT: *Not as cute as a Newton, but much more functional.* ****

FILEBOX

HP 200LX

Weight: 11 ounces.
Batteries: Two AA.
I/O: One PCMCIA Type II.
Operating System: MS-DOS 5.0.

$699 for 2MB; $549 for 1MB
Hewlett-Packard
(800) 443-1254, (503) 757-2000
Reader Service No. 621

PHOTOGRAPHS BY ARNOLD TIDSELJO

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

The Canvas.

The Brush.

The Palette.

Diamond's SpeedStar 64 ISA card with CorelDRAW™ 3.0, the easy-to-use starter graphics system.

Diamond's Stealth 32 graphics card with CorelDRAW™ 3.0 for affordable, all-around graphics.

Diamond's Viper SE card with CorelDRAW™ 3.0 for colorful, smooth-running presentations.

Diamond's ultra-fast Stealth 64 VRAM or DRAM graphics card with CorelDRAW™ 4.0 for high-resolution, 24-bit color illustrations.

Diamond's Viper Pro card with CorelDRAW™ 4.0 for enhanced video playback and photo-realistic, true-color graphics.

The Bundle. If you're looking to become a multimedia artiste, you're going to need the right tools. Which is why Diamond is proud to offer its fine art collection—a new series of specially-priced multimedia graphics packages. Each one includes a Diamond top-rated, high-performance graphics card and CorelDRAW,™* the world's best-selling Windows graphics software. There is a bundle for every need. From high-end multimedia graphics users to beginners, now everyone can have the power of CorelDRAW.™* So call **408-736-2000** for full details or call our 24-hour FAX-Back service at **1-800-380-0030**.

DIAMOND
Computer Systems, Inc.

COREL DRAW!
The Best in Graphics

*Includes: CD-ROM Version, Quick Reference Booklet, Installation Guide. User and Clipart Manuals Available at Extra Cost.

All trade names referenced are the service mark, trademark or registered trademark of the respective manufacturers. Diamond reserves the right to change specifications without notice. ©1994 Corel Corporation. ©1994 Diamond Computer Systems, Inc., 1130 East Arques Avenue, Sunnyvale, CA 94086. 408-736-2000, Fax: 408-730-5750.

Circle 172 on reader service card.

THERE'S A CONCEPT!

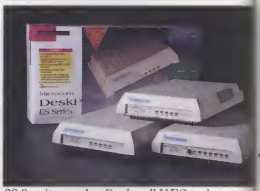
WHY BUY A 14,400 bps MODEM WHEN YOU CAN GET A MICROCOM 28,800 FOR $299.

Microcom modems already give you the fastest speeds and highest reliability in the industry. Now we've added another powerful advantage: unbeatably low prices.

Take our DeskPorte *FAST* ES 28.8. For only $299, it delivers twice the speed of 14,400 bps modems, with throughput rates of 115,200 bps. A great all-purpose modem for DOS, Windows and Unix.

For Windows users, our DeskPorte *FAST* EP 28.8 is a terrific deal at just $399. Using Microcom's innovative parallel port technology, it achieves sizzling speeds: up to 300,000 bps throughput without loss of data.

And if you want outstanding value in a full-featured V.32*bis* modem, put our $239 DeskPorte ES 14.4 at the top of your list. It delivers throughput rates of 57,600 bps. And connects with a wide variety of modems now in use.



Each model features full MNP® 10 (Microcom Networking Protocol™ Class 10) support.* That's the standard we developed for sure-fire connectivity under all line conditions. The 28.8 units employ Rockwell V.FC technology. And all three come with 14,400 bps fax software plus a free 5-year warranty.

So if you thought price might keep you from moving up to a Microcom modem — think again.

For more information, see your Microcom dealer; for a free modem info kit, call Microcom at

1-800-822-8224

COMPUTER City® SUPERCENTER

MicroWAREHOUSE®
1-800-367-7080

PC Connection®
1-800-800-4396

EGGHEAD SOFTWARE
North America's Software Riggsports.

microcom®

The brightest ideas in remote access.

Microcom, Inc. 500 River Ridge Drive, Norwood, MA 02062-5028
Phone 617-551-1000 • Fax 617-551-1021

*DeskPorte *FAST* ES 28.8 implements MNP 10 through 14,400 bps

Microcom and MNP are registered trademarks and DeskPorte is a trademark of Microcom Systems, Inc. All other trademarks are the property of their respective trademark holders.

Circle 137 on reader service card.

Logitech Catches a Wave-Table

USABILITY: *Short on interrupts for installation, otherwise fine.* ***
PERFORMANCE: *Minimal harmonic distortion, good stereo separation, wide frequency range.* ****
TECHNOLOGY: *Ear-friendly OPL-4 wave-table synthesis, DSP, excellent MIDI.* ****
VERDICT: *Great sound, great software.* ****

What do you really want from a sound card? WAV files that don't sound like WAV files? Decent software? MIDI playback that has you wondering, "Is it live, or . . . ?" How about the sweetest note: a price tag that's music to your ears?

Most of what you want is sure to be in Logitech's $299 SoundMan Wave. In our lab tests, this board came out singing like a pro with above-average MIDI music, wave-table synthesis that leaves the 1980s FM-technology sound boards squeaking in its wake, and a nice, basic mixing desk for switching MIDI events.

If you've ever tinkered with a grungy old Fostex deck to make demo tapes for your garage band, you're likely to pick up the limitations of the SoundMan Wave's samples, which include some strained guitar and piano sounds. But the SoundMan placed very highly in ZD Labs tests for recording and playback of CD-quality sound. In fact, it placed in the very same league as Turtle Beach's Multi-Sound—and that's the major league—thanks largely to its superior Yamaha OPL-4 chip.

To justify the purchase price as a business expense (a neat trick if you can do it), SoundMan Wave includes fine software for voice annotation and text-to-speech playback. So there's no excuse for not installing SoundMan Wave at work—for productivity's sake. Yeah. MATTHEW J. LAKE

Great Sound, Man: Get jammin' with SoundMan Wave's wave-table synthesis chip and magnificent MIDI.

FILEBOX

SoundMan Wave

Main Benefits: SCSI CD-ROM interface, stellar waveform audio, high-fidelity MIDI, OPL-4 wave-table synthesis (courtesy of Yamaha's chip), DSP option.

$299
Logitech
(800) 231-7717, (510) 792-8901
Reader Service No. 622

Seagate Elite 9

Driving a Hard Bargain

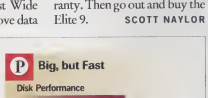
USABILITY: *Easy to install and configure.* ****
PERFORMANCE: *As fast as they come.* ***
TECHNOLOGY: *How'd they get so much storage into such a small space?* ***
VERDICT: *50 cents per megabyte—a real bargain.* ****

They say you can never be too rich, too thin, or have too much storage. But isn't 9GB stretching it a bit? For your server? Heck, no. Seagate Technology's 9GB hard drive, the Elite 9, is also good for desktops that need lots of storage space.

Considering the growth of network applications such as Microsoft's Office—with 31 disks demanding 82MB for full installation—you need all the hard-drive acreage you can get. And don't forget other memory-intensive applications, such as video editing and digital special effects. The Elite 9, with 14 platters spinning at 5,400 rpm, has plenty of room to house them all despite the relatively small size of its box—around 8 by 6 by 3¼ inches.

Our lab-based performance tests proved Seagate's Elite 9 Fast SCSI drive is no slow, hulking mass of magnetism, with a disk speed right up there with high-capacity drives from Hewlett-Packard and Quantum. If that doesn't satisfy you, Seagate also offers Fast Wide Interface, which can move data across the bus at even faster speeds. At less than 50 cents per megabyte, the Elite 9 represents a new low-cost storage solution in what used to be a high-rent district: optical jukeboxes. Still not convinced? Check out Seagate's five-year warranty. Then go out and buy the Elite 9. SCOTT NAYLOR

Massive Storage: There's nothing more embarrassing than running out of server storage, but the Elite 9 can guard against that without sacrificing speed.



NOTE: THE HP AND THE QUANTUM REPRESENT THE FASTEST DRIVES IN THEIR CAPACITY CLASSES. THERE ARE NO 9GB DRIVES TO COMPARE TO SEAGATE.

FILEBOX

Seagate Elite 9

Track-to-Track Seek Time: 0.9 milliseconds.

Average Latency: 5.56 milliseconds.

Average Seek Time: 11 milliseconds.

Cache: 1,024 kilobytes.

$4,500
Seagate Technology
(408) 438-8111
Reader Service No. 623

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD TOSELLO

Look for us on all the major networks.

Word about PCs from Hewlett-Packard is getting around, and ratings are soaring. According to a recent CRN/Gallup survey, "Use of HP desktops in Fortune 1000 companies has doubled in the last year."[1]

And with good reason. Our broad range of PCs not only meets users' expectations for power and ease of use, it also answers the needs of a network manager. With built-in features like on-board networking, advanced security and asset tracking, HP PCs have what it takes to be top performers on virtually any network. And soon our expertise in network management will reach all the way to the desktop, as we continue to pioneer the development of DMI (Desktop Management Interface).

For more information or the name of your nearest HP dealer, call us today at 1-800-322-HPPC, Ext. 8324. And tune in to the network superstars.

HEWLETT® PACKARD

Give your other PCs something to look up to.

If you're connecting PCs to a network, scan this chart and you'll see it's time to hook up with HP.

STANDARD NETWORKING FEATURES	HP VECTRA M2 PC	COMPAQ DESKPRO/XE	DELL NETPLEX
Advanced Bus Architecture	VL-bus		
Integrated Networkong Interface	16-bit		
Integrated, multiprotocal Boot-ROM	X		
ISA Plug-n-Play Compliant	X	X	
Multilevel Security Features	X	X	X
Asset tracking	X	X	
PC tattooing	X	X	
Optional Desktop Management Software	X		
Bi-directional parallel port	X	X	X
Desktop Management Interface (DMI)[1]	X		

HP quality in value-priced PCs.

- *Intel 486SX, 486DX2 and DX4*
- *Chip upgrades to higher performance*
- *On-board accelerated local-bus video*
- *210-MB hard drive*[1]
- *4-MB RAM, expandable to 64-MB*
- *512-KB or 1-MB of Video RAM standard*
- *ISA Plug-n-Play compliant*
- *Desktop Power Management*
- *EPA Energy Star certified*

High-performance network-ready PCs in a slimline package.

- *Intel 25- and 33-MHz 486SX, 50- and 66-MHz 486DX2, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *170-MB, 14-ms Fast-IDE hard drive*
- *32-bit Fast-IDE local-bus hard disk interface*
- *4- or 8-MB RAM, expandable to 96-MB*
- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*

High-performance PCs for the connected office

- *Intel 33-MHz 486SX; 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *Four mass storage shelves; four expansion slots*
- *One available 32-bit VL-bus slot*
- *210-MB, 14-ms Fast-IDE hard drive*
- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*

Top performance for experts in connected environments.

- *Intel 60-MHz Pentium with 256-KB write-back cache*
- *One PCI slot, one shared PCI/ISA slot, two ISA slots*
- *Four mass storage shelves*
- *270-MB Fast-IDE hard drive with 12-ms access time*[1]
- *Integrated S3 928PCI graphics accelerator*
- *2 MB of VRAM expandable to 4 MB, 1600 x 1200 video resolution*
- *8-MB RAM, expandable to 192-MB*

HP Vectra VL2

- *Local bus Fast-IDE hard disk interface*[2]
- *1280 x 1024 video resolution*[2]
- *Optional 128- or 256-KB cache memory*[2]
- *Free three-year limited warranty for parts and labor*[3]

from
$1,099[1]

HP Vectra N2

- *1 MB of video RAM standard, expandable to 2 MB*
- *Slimline package with two mass storage shelves and three ISA slots*
- *Optional integrated 10Base-T networking*
- *Multilevel security*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[3]

from
$1,309[1]

HP Vectra M2

- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*
- *Optional integrated 10Base-T networking*
- *Systems Diagnostics Utility*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)*[3]
- *Free three-year limited warranty for parts and labor*[3]

from
$1,679[1]

HP Vectra XP

- *Integrated 16-bit 10Base-T networking interface with bus-master DMA*
- *Flash EPROM*
- *Systems Diagnostics Utility*
- *Power-on Self Test*
- *Multilevel security*
- *Asset tracking with non-erasable serial number and customizable PC tattooing*
- *Bi-directional parallel ports*
- *Free three-year limited warranty for parts and labor*[3]

from
$3,559[1]

intel inside

yes NetWare tested and Approved

All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 pre-installed; HP mouse and keyboard included. *Features included with some models. [1]List price, dealer prices may vary. Monitor not included. [2]Other capacities available. [3]First year on-site, 24-hour service. Second and third year return to dealer. [4]Available 9/1/94. [5]With permission CRN/Benchmark. MS-DOS is a U.S. registered trademark and Windows is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. PPG403 ©1994 Hewlett-Packard Company

When trouble is mounting

...solve Mac to PC file exchange problems with Conversions Plus.

Gone are the days when your work came to a grinding halt because you were working in a PC environment and someone passed you vital information on a Macintosh disk. Conversions Plus allows you to put a Mac in your PC, open it, convert documents between PC and Macintosh software automatically, and save Mac files to the disk – all while retaining the original formatting, **including** embedded graphics. You can even format Mac disks on your PC! External cables and cards are unnecessary. Just load the Conversions Plus software and stop your Mac to PC troubles from mounting, instantly. To learn more about Conversions Plus, and its more than 1000 file translation paths, **call us at 800-240-0030.**

Ask about our multi-packs, site licenses, and Macintosh products.

DATAVIZ™

55 Corporate Drive • Trumbull, CT 06611 • 203-268-0030

Circle 124 on reader service card.

COMPUSA THE COMPUTER SUPERSTORE

COMPUTER City

MicroWAREHOUSE

EGGHEAD SOFTWARE North America's Software Eggperts

FreeHand 4.0 for Windows

Attack of the Killer Bezagons

USABILITY: *Inscrutable no more.* ★★★
TECHNOLOGY: *OLE 2.0, better text, drag-and-drop everything.* ★★★★
VERDICT: *Easy-to-use tools, but not cheap.* ★★★

Overwhelmed by the bulk of CorelDraw? Turned off by the elitist cachet of Adobe's Illustrator? Find Aldus FreeHand far too complicated?

Relief is in sight: Aldus FreeHand 4.0 for Windows struts its technical stuff without forcing you through the byzantine procedures of previous versions of the program. Gone are dozens of the dialog boxes you once had to navigate to perform common tasks. In their place are floating tool palettes and neat new objects like bezagons. To directly edit objects, Aldus has added the Inspector, never more than a key combination (Ctrl-I) away. But not only is the product a lot easier to use, it's now stronger, too.

Inspector Gadget The Inspector's contents change depending on the highlighted object. When you click on a text selection, for example, the Inspector shows details such as alignment or width. Click on a group of objects, and it shows their dimensions and other attributes. The Inspector window also has its own button bar for quick access to a number of fine-tuning controls.

Layer controls, color and tint settings, and styles are all available as toolboxes, which roll up (like their counterparts in CorelDraw) to a title bar when you don't need them.

The interface sports drag-and-drop support: To apply just about any attribute from the Style, Tint, Color Mixer, or other toolbox to an object onscreen, simply drag the attribute onto the object. Changing an attribute shared by many objects is just as easy. For example, to change all red objects in a painting to purple, create the new color in the tint palette and drag it on top of red in the color palette.

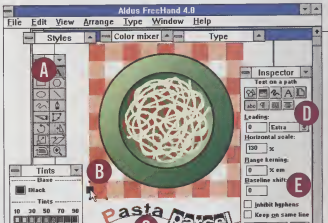
More Control What about real power? FreeHand 4.0 packs plenty. There's a slew of new drawing tools, including the polygon and the bezagon (a polygon with bezier points).

Text controls have also been improved. The tool for evening out two columns of text makes FreeHand a natural for creating tables. The program features added versatility in page layout as well: You can now combine different page sizes in a document, which is useful if you want to put business cards and letterhead in a single file.

Want to try your hand at freehand text? There's a calligraphic tool that enables you to set its nib width and write away (a drawing tablet helps here). When you're done, a command connects the intersections your line makes with itself.

FreeHand 4.0 doesn't have enough juice to lure away current Illustrator users. But if you want to avoid the overkill of Corel's leviathan, FreeHand has the power and simplicity to make the leap worthwhile.

MATTHEW J. LAKE



A. New **tool palettes** for colors, tints, text, styles, and more roll up to title bars to give you room to work.

B. Drag and drop is the natural way to work—create your color, tint, or style, then apply it to any object.

C. Type straight onto the screen, then apply all kinds of **text styles**—such as curved baselines or formatting—and edit at will.

D. The **Inspector** crams information and controls into a small box with help from context buttons.

E. FreeHand 4.0 adds so many text controls that it will become your de facto table **layout tool.**

See-Through Colors: One nice but tough-to-find FreeHand feature works around PostScript's inability to handle color transparency. Hold down the Alt key as you select Arrange, Path Operations, Intersect, and the program will create a clone of the intersection with a mixture of each piece's colors. This isn't a unique feature—Illustrator has had it for a while—but it's sure an improvement over PostScript's limitations.

FILEBOX

FreeHand 4.0 for Windows

New Interface Features: Inspector dialog box, floating tools, roll-up tools, drag and drop.

New Graphics Features: Color and tint mixer dialog boxes, calligraphic pen effect.

Minimum RAM: 4MB.

Disk Footprint: 25MB.

$595
Aldus Corp.
(800) 274-7243, (206) 622-5500
Reader Service No. 624

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

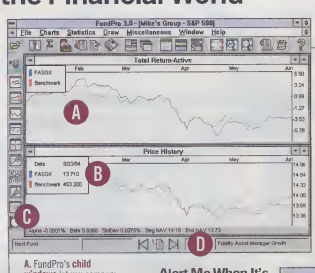
Windows on the Financial World

Shaken by the recent free fall in financial markets? Don't be. Investing is like bungee jumping: What goes down eventually comes back up. With that in mind, great buying opportunities brighten today's cloudy skies. The question is *what* to buy. Neither FundPro 3.0 for Windows nor Reuters Money Network for Quicken Users can give you the exact answers, but both can help you find those undiscovered investment gems.

Reuters Money Network is the Windows counterpart of Reality Technologies' DOS-based personal investor. But there's a twist: It taps your Quicken files (or any QIF file) as a shortcut to setting up and managing your personal portfolio. Reuters Money Network gives you the tools to track, analyze, and even purchase mutual funds, stocks, bonds, options, and bank CDs. By contrast, FundPro is tightly focused on mutual funds, which are the small investor's preferred vehicle.

FundPro's $400 price tag is cheap for its class, and at $10 on the street, Reuters Money Network may as well be free. But neither is much use unless you also subscribe to regular financial updates via the companies' online data services. For these, figure another $13 to $25 a month, depending on your information appetite.

Scope and Speed In spite of its low cost, Reuters Money Network seems the richer program. It lets you dabble in a wider range of financial instruments with a bounty of useful services, including investment alerts and market briefs—even your own personalized electronic newspaper clippings from the *Wall Street Journal* and other must-reads for investment data.



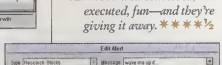
A. FundPro's **child windows** let you compare indicators.

B. Legend windows display select data.

C. Critical **statistical footnotes** appear at bottom of screen.

D. Navigation buttons let you maneuver easily within your portfolio.

Alert Me When It's Over: Don't want to read ticker tape? Let Reuters' Alert Manager wake you if a stock's earnings hit a new high, a mutual fund manager quits, or a lawsuit is filed. Just try to get your broker to do that for you.



must-reads for investment data.

But FundPro is much easier to use, offering an incomparable array of statistical indicators. Some are basic but would take hours to glean from individual sources—price history, relative strength, alpha and beta percentages, standard deviation. Others are so esoteric—RSI, Stochastic, MACD—that just being able to pronounce them wins you a seat on the exchange.

Reuters Money Network alerts you when an investment hits a certain price or when milestones are reached. Just try wringing this level of personal service from your broker.

Reuters Money Network and FundPro both have crisp, attractive interfaces that fully exploit Windows to put the tools in your hand to help you navigate reams of confusing market data. FundPro's special genius is that it conveys a great deal of information on one or multiple funds using totally flexible chart windows.

Lay Your Money Down FundPro's chart orientation, depth, and right-on tutorial make it more informative and easier to learn and use. Reuters Money Network, on the other hand, is less expensive, covers markets FundPro doesn't, and applies truly innovative technology. But unless you have a screamingly fast PC, its huge databases will really hamper your system's performance.

Choose FundPro if mutual funds are your preference and you enjoy the easy life. Try Reuters Money Network if you want to branch out from there. If you have the time and money, buy both. MIKE HOGAN

FundPro

USABILITY: *Tame the stock market with a heavy dose of intuition.* ****

TECHNOLOGY: *Good, balanced combination of standard and esoteric indicators.* ***

VERDICT: *How can such a powerful application be so easy to use?* ****½

Money Network

USABILITY: *Navigate acres of convoluted market stats with ease.* ***

TECHNOLOGY: *Smart Quicken link, downloads data and news clips.* ****

VERDICT: *Well conceived, well executed, fun—and they're giving it away.* ****½

FILEBOX

FundPro 3.0 for Windows

Requirements: 8MB of disk space, 4MB of RAM.

$400, plus $25/month for daily fund data updates
Manhattan Analytics
(800) 251-3863, (310) 374-2142
Reader Service No. 625

Reuters Money Network for Quicken Users

Requirements: 8MB of disk space, 4MB of RAM.

$24.95
Mutual-fund–oriented Gold Plan with some stock quotes and broker access, $12.95/month; Omnibus Platinum Plan, $18.95/month, plus additional service costs
Reality Technologies
(800) 521-2471
Reader Service No. 626

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Hot Wax and Jet Sprays Have Their Place. But Not In Quality Color Printing.

Introducing the world's only true 600x600 dpi desktop color laser printer.

The QMS® *magicolor* Laser Printer gives you output resolution that's twice that of enhanced color inkjet and thermal wax transfer. Fast and networkable, the QMS *magicolor*™ Laser Printer also offers extremely low consumable usage and cost unmatched by any other printer in its price range, with new features for even less money. Here's your chance to polish your image. For more information on how the QMS *magicolor* Laser Printer can make your work shine or the ColorSpecialist nearest you,

Call 800 841-0753 Dept. 4034.

QMS

For service on QMS and other products, call 800 762-8894 (U.S.) • C-Fax 800 633-7213
E-mail: info@qms.com • Canada 800 263-5508

QMS Reference Price: QMS ColorScript Laser 1000 $7,999 • QMS *magicolor* Laser Printer 12 MB $9,999 • QMS *magicolor* Laser Printer 28 MB $10,999

QMS, the QMS logo and *magicolor* are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 205 633-4300

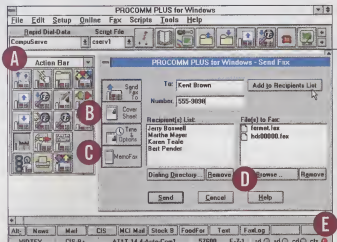
New! SOFTWARE
Procomm Plus 2.0 for Windows

USABILITY: *Finally looks and acts like a real Windows program.* ****
TECHNOLOGY: *Effortlessly combines faxing and data communications.* ****
VERDICT: *The old standard is still at the top of the heap.* ****

Push Your Modem to the Limit

Procomm has always been one of the best communications tools around. From its early shareware DOS genesis to its first Windows release, ProComm's been the standard by which communications programs are judged. But recently, Mustang Software's Qmodem Pro for Windows, another shareware descendant, and Delrina's Communications Suite shipped with useful features the aging Procomm for Windows lacked.

The latest version, Procomm Plus 2.0 for Windows, has all the fax functionality you could want. Unlike Qmodem Pro, Procomm Plus doesn't skimp on fax features, nor does it take the cumbersome two-program approach of Communications Suite. Instead, Procomm Plus is a highly functional, fun-to-use, integrated communications program that is sure to give your fax modem the workout it deserves.



A. Procomm's **Action Bars** are now customizable and you can position them anywhere.

B. You can launch Procomm's **cover sheet editor** and scheduler from the same screen.

C. The **MemoFax** feature lets you write and fax a note without using a separate word processor.

D. The robust **send-fax options** let you browse for recipients and files to be faxed.

E. Procomm now has useful software **modem lights.**

You've Come a Long Way, Baby: It's hard to believe this was once a DOS-based shareware program. You can expect to find all the communications basics you were used to in Version 1.0, but this isn't your father's Procomm Plus. Not only has Version 2.0 been beautified, it now includes a full suite of fax features that rival those of full-fledged fax programs. You can even use ProComm to set up your own fax-back service.

Timing Is Everything: Fax scheduling made easy—click on the calendar and clock to select the time you want your faxes sent.

You Look Mahvelous

While the new fax features are the meatiest addition, Procomm Plus also has some great usability tweaks. For example, the program now follows most Windows conventions—you won't have to fiddle with the awkward two-tier setup grid that made changing terminal emulation settings or switching file transfer protocols a mind-boggling adventure.

Procomm now features customizable button bars, including ones that are predefined for MCIMail and CompuServe, as well as a fax-specific button bar. Plus, there's now balloon help that pops up when you sweep your mouse over the buttons. (But why did DataStorm yank the handy key combination that let you page through the scrollback buffer?)

Procomm now cooperates with Windows' File Manager to give you drag-and-drop file transfers. You can upload files, whole directories, and even upload or start scripts by simply dragging the appropriate file from File Manager to the program window, or by dropping it on top of the minimized Procomm icon. And speaking of scripts, as you'd expect, Procomm Plus 2.0 will convert all your 1.0 scripts and dialing directories without a hitch.

Fax Maniacs We confess—we've gone into a faxing frenzy since we started using Procomm Plus. Like most fax packages, it lets you fax from within other applications by adding a faux printer driver. And it has all the other fax basics, including full send and receive functionality and a fax viewer and cover-sheet editor (both senselessly hidden under the Tools menu instead of under the Fax menu—but we're nit-picking again).

Pleasant surprises include sophisticated fax features like polling, which checks remote fax machines for received faxes. But best of all, in host mode Procomm now includes a fax-back feature that lets users dial in and request faxes to be sent to them. Of course, you can specify which faxes to make available to callers.

For all but the most die-hard BBS surfers (for whom we recommend Qmodem Pro), Procomm Plus 2.0 for Windows is the clear choice for all modem communications.

SHYAMALA REDDY

FILEBOX

Procomm Plus 2.0 for Windows

Number of Modem Models Supported: 565.

Number of Terminal Emulations Supported: 30.

The Competition: Only the WinComm Pro/WinFax Pro combo in Delrina's Communications Suite comes close, and it lacks the streamlined integration of Procomm Plus 2.0.

$179
Datastorm Technologies
(314) 443-3282
Reader Service No. 627

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

8 hours of battery life. Yes, you read it right: 8 hours.

DELL® LATITUDE™ XP
INTEL® DX4™ 75MHz SYSTEM

$3399

BUSINESS LEASE†: $126/MO.

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY*
- NEW LITHIUM ION BATTERY

ORDER CODE #600011

DELL™

To Order, Call

800-545-9671

In Canada‡, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11XCY

New! SOFTWARE: Scan/US

Shhhh! It Knows Where You Live

USABILITY: *Neat map-based interface, good documentation.* ★★★
TECHNOLOGY: *Clever tie-in between geography and data.* ★★★
VERDICT: *Offers information and analysis you can't afford to do without.* ★★★★

If you can't target your customers with cross-hair accuracy, your marketing plans—no matter how creative—will fail. To distribute materials efficiently, plan branch office locations, and target direct mailings, you need accurate demographic information fast.

Your choices? Spend thousands (or tens of thousands) of dollars for a custom report from a demographer, or fork over just $695 for Scan/US's geomarket software for Windows and make an unlimited number of custom reports for yourself. Not a tough choice.

All You Need Scan/US is a serious data arsenal for marketers, sales professionals, or just about anyone who needs accurate customer demographics. Suppose your target market is college-educated 35- to 45-year-olds earning $60,000 or more per year, and you want to know where they live. Scan/US pinpoints this market down to county, city, zip code—even 1/16-square-mile accuracy.

The program comes with figures from the most recent census (1990) and projections based on it. In the base package, all the census variables you might need are covered, including population trends, race, age, and labor force data.

Beyond basic demographics, there are figures that include household and family income, school enrollment, and education by race. And if you need to know median house prices in a given area, you can get some idea of that, too—although fast-changing data like this isn't always correctly tracked by the census department.

Added to the demographics are geographical snippets that go beyond county and state lines. The U.S. Interstate road network, cities, and large shopping malls are covered in the program's various views.

You can also add data of your own to the program pai lessly. If you have a database of clients with zip codes, you can import Excel, DBF, or ASCII data and have it recognized right away. And Scan/US sells packs of business-related data, such as shopping mall break downs and zip codes, separately.

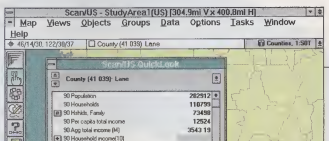
It's just as easy to export data. We produced an information-dense report in minutes by exporting regional demographic information to a spreadsheet and formatting the data a little. For researching business proposals, it's a godsend.

You're new to demographics? Don't worry about it—the program's clear primer and the accompanying subscriptions to *Business Geographics* and *American Demographics* magazines get you started. And the easy map-based Windows layout, while a little fussy at first, is less overwhelming once you get used to it.

Floppy Overload The main drawback of Scan/US? It comes on more than a dozen floppies—with more to come when you add data packs. A more efficient scheme would be CD-ROM distribution with key-code encryption for additional data.

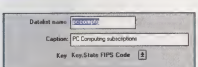
The question about this product is not whether to buy it—we recommend Scan/US for anyone who makes business decisions based on the location of a market—but when to buy it. Be sure to pick it up before your next big marketing project, and upgrade it every year with new projections.

MATTHEW J. LAKE



Read It All: You can plug in your own figures from spreadsheets, databases, or text files, because Scan/US can read Excel, DBF, and ASCII data files directly—there's no importing necessary. For reports, you can export Scan/US data, too.

Making Sense of Data: The core is Scan/US's database. Based on the 1990 census, with projected figures for years after that, it includes data organized by population trend, race, age, and labor force—plus household and family income, school enrollment, and median house prices. Once you've figured out whom you want to reach, you can see where your marks live in relation to geographical landmarks, like highways and shopping malls.



FILEBOX

Scan/US

Memory Required: 3MB of RAM.

Hard-Disk Footprint: 14MB.

Imports Data From: Excel, DBF, and ASCII formats.

Data Included: 1990 census figures and this year's projections for family and household income, school enrollment, education, housing prices, shopping malls, U.S. Interstate road networks, and zip codes.

$695
Scan/US
(800) 272-2687, (310) 820-1581
Reader Service No. 710

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

7 day a week, 24 hour a day hotline dedicated to notebook support, and nothing but notebook support.

DELL LATITUDE
INTEL SX 33MHz SYSTEM

$1999

BUSINESS LEASE: $74/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 200MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)*
- 1 YEAR WARRANTY†

ORDER CODE #600009

DELL™

To Order, Call

800-545-9671

In Canada‡, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City‡, Call 800-228-7811

Keycode #11XCZ

New! SOFTWARE: PagePlus 3.0

Dad, Can I Borrow the DTP?

USABILITY: *Surprisingly easy to use.* ****
PERFORMANCE: *Slow to load documents and import files.* ***
TECHNOLOGY: *Lacks long-document features.* ***
VERDICT: *Great value.* ****

When Serif's PagePlus grows up, it wants to be a high-end desktop publisher. With Version 3.0, it's stuck in that awkward teenage stage—way too powerful to fit in the low-end market, and not seasoned enough to go to bat against the more mature Aldus PageMaker and QuarkXPress.

But PagePlus 3.0 is a sleek, sharp, hormone-ridden powerhouse of a program that is perfect for those who lust after some of those grown-up DTP features but find the price and complexity of PageMaker or QuarkXPress daunting. For just $59.95, PagePlus gives you the power to create stunning documents using text rotation, irregular text wraps, and color separation—all complex features that nearly put PagePlus in competition with those much more expensive products.

With Version 3.0, you'll find some welcome enhancements, including automatic page numbering and hyphenation, an integrated word processor, running headers and footers, tabs, tab leaders, and master pages.

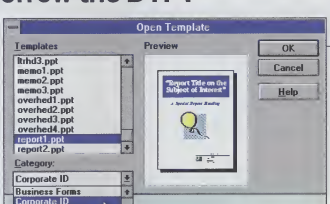
PagePlus 3.0 even includes some indispensable features that, unbelievably, you won't find in the higher-priced PageMaker, including a thesaurus, a JPEG import filter, a word and character counter, and a print preview window. (You can, however, find these features in QuarkXPress.) The table editor also works better than PageMaker's. In addition, Serif has added enough ease-of-use enhancements to make learning the program a snap—without ever having to crack open a manual.

Peer Pressure Although PagePlus really packs in the goodies now, it still has only about half the features and controls of PageMaker or QuarkXPress. Most notably, PagePlus lacks helpful long-document features such as indexing, table of contents generation, and multifile book building. This program is simply not designed for those kinds of tasks. Also missing is the capability to open more than one document at a time without running multiple versions of the application. Other high-end options and refinements are either watered down or missing.

PagePlus still has its ChangeBar floating palette, Serif's version of PageMaker's Control palette and QuarkXPress's Measurements palette. All of these let you format text or modify objects without opening menus, but the PagePlus version is clunkier and less comprehensive than those of the other programs.

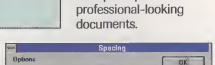
The WritePlus text editor, similar to PageMaker's story editor, lets you define paragraph styles and font characteristics (such as boldface and italics), but you can't change fonts without reapplying styles, a real usability blunder. PagePlus also lacks PageMaker's automatic baseline leading option, which precisely controls where the first baseline of text falls—something serious designers need.

Not Too Shabby Nonetheless, PagePlus 3.0 is an awesome deal for the money. When it comes to price, its competitor is really the $139 Microsoft Publisher, which has a Page Wizard that beats PagePlus in the ease-of-use category. But PagePlus is much more powerful. For the price, it's an excellent program. **BOB WEIBEL**



Terrific Templates: You won't find this PagePlus document preview feature in the higher-end packages like PageMaker or QuarkXPress. And Serif provides a generous variety of document templates, which make it simple to produce professional-looking documents.

Limited Space: PagePlus 3.0 has some shortcomings when you compare it to PageMaker or QuarkXPress. For instance, it doesn't let you enter absolute values for Paragraph and Space Above settings. Rather, you're forced to enter percentages into the Spacing section. This method makes it practically impossible to have any creative formatting and simultaneously make sure your baseline text aligns across all columns.



FILEBOX

PagePlus 3.0

System Requirements: Microsoft Windows 3.1 or later; 2MB of memory; 4MB of hard-disk space, 12MB for full installation.

Competition: Version 3.0 pushes PagePlus ahead of PFS: Publisher and Publish It for Windows, leaving Microsoft Publisher as its strongest competitor.

Extras: Imports Photo CD and JPEG-compressed images, OLE 1.0 client, TWAIN scanner support.

$59.95; $99.95 for the Publishing Suite, including DrawPlus, TypePlus, TablePlus, and PhotoPlus collection
Serif
(800) 697-3743, (603) 889-8650
Reader Service No. 628

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

6 lbs. of Latitude* or 5.9 lbs. of Latitude XP and you still get over 500 megs of hard drive space and 32-bit local bus video on the road.

DELL LATITUDE
INTEL DX2™ 50MHz SYSTEM

$2799

BUSINESS LEASE: $104/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 524MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)
- 1-YEAR WARRANTY

ORDER CODE #600014

DELL™

To Order, Call

800-545-9671

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11XDA

New! SOFTWARE: OmniPage Professional 5.0 vs. WordScan Plus 3.0

The Strong, Silent Typists

Say you have a pile of printed documents on your desk that you need on disk. You can hire a typist or pick up a scanner—but if you're dissatisfied with the scanner's OCR bundle, where do you turn next? To the professional-strength new versions of Caere's OmniPage Professional 5.0 for Windows and Calera Recognition Systems' WordScan Plus 3.0.

Both products use nonlinear neural-net recognition techniques—which means that they offer improved recognition rates on even the ugliest documents. Both have also had facelifts that enhance their ease of use. In the case of WordScan, its recognition engine remains unaltered since the last time we reviewed it (see "Calera's Souped-Up New WordScan—Faster, Slicker OCR," New! December 1993, page 103), with only OLE 2.0 support, interface changes, and $100 off the list price to mark the upgrade. OmniPage, however, ships with a new OCR engine, as well as an image editing program.

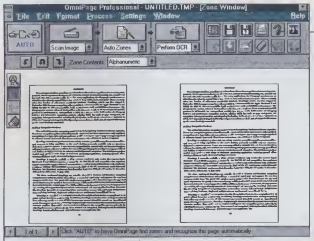
Our OCR test suite included photocopied and reduced four-column magazine articles, as well as text-and-graphic documents riddled with tiny fonts. On all but the most cluttered and illegible of these, both programs made the same small number of mistakes—about 20 out of every 1,050 words. On simple 12-point Courier print, they made almost no mistakes. Lower-priced neural-net OCR programs, such as Xerox Imaging Systems' $99 TextBridge, are not as accurate or as fast on complex documents.

OmniPotent Formatting and page layout are OmniPage Professional's strengths. Its new built-in text editor retains the formatting of the original document like a pro—even on extremely complex layouts with variable text sizes. Its integrated Image Assistant graphics editing software is also a boon worth noting.

A Fair Clip OmniPage's downfall is its default speed setting. When we threw it some really complex documents, it ran about a third slower than WordScan Plus. Some of WordScan's speed advantage, however, is lost in proofing time, because it can't match OmniPage's formatting and page-layout strengths on degraded pages. With the test magazine article, for example, WordScan Plus was as accurate as OmniPage, but it inaccurately translated fonts and font sizes in many places. By contrast, OmniPage proved to be nearly perfect at maintaining the formatting of documents.

Want a familiar interface? WordScan Plus has it, no matter what software you use. Its chameleonlike interface mimics the standard toolbar and dialog boxes of your suite-based Windows applications—whichever suite it may be. Just select the name of your word processor—Word for Windows, WordPerfect, or Ami Pro—during installation. And here's another plus: You can start the OCR process from the File menu of your other apps.

Both WordScan Plus and OmniPage are generally fast, accurate, familiar, and simple to use—although WordScan Plus has a slight speed and usability edge. However, if you want to retain your scanned pages' formatting, Professional is the clear choice. DAVID HASKIN



Now You See It: The toolbar of Caere's OmniPage Professional enables one-click recognition for simple pages (as shown above) or meticulous step-by-step work for ultracomplex page layouts.

Look Familiar? Calera's WordScan Plus mimics the toolbar of your favorite Windows applications (like Word for Windows, shown here) and connects to them using OLE 2.0.

OmniPage

USABILITY: *Configurable, clear settings.* ****
PERFORMANCE: *Default settings drag.* ***
TECHNOLOGY: *Neural-net accuracy.* ****
VERDICT: *OmniPage for formatting.* ****

WordScan

USABILITY: *Mimics your other apps.* ****
PERFORMANCE: *Recognition rates faster, but requires more proofing time.* ***
TECHNOLOGY: *The same neural-net accuracy.* ****
VERDICT: *WordScan for speed.* ****

FILEBOX

OmniPage Professional 5.0

Memory Required: 8MB of RAM.

Operating System: Windows 3.1 or later.

$695
Caere Corp.
(800) 535-7226, (408) 395-7000
Reader Service No. 629

WordScan Plus 3.0

Memory Required: 4MB of RAM.

Operating System: Windows 3.1 or later.

$595, $249 without Popup Verifier or multipage support
Calera Recognition Systems
(800) 395-7000, (408) 720-8300
Reader Service No. 630

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

5

5 different ways how, technically speaking, we give you 8 hours of battery life.

1. Latitude XP is powered by a new Lithium Ion battery. You get up to 30% more power for the same weight as NiMH batteries.

2. Dell has created the smart Lithium Ion battery—a battery with built-in microprocessor and indicator light to keep you aware of available power.

3. Latitude XP's smart CPU dynamically adjusts energy consumption to the specific software application being used.

4. With our easy to use Windows power management, you can choose from 4 pre-set levels or create your own custom settings.

5. Our Lithium Ion battery lets you fast charge your battery anytime without the memory effect, common to NiMH batteries.

DELL™

To Order, Call
800-545-9671
In Canada: Call 800-668-3021
Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City: Call 800-228-7811

Keycode: #11XDB

DELL LATITUDE XP
INTEL DX4 75MHz

$3699

BUSINESS LEASE: $134/MO.
• 9.5" DUAL SCAN STN COLOR
• 8MB RAM
• 524MB HARD DRIVE
• 3-YEAR WARRANTY
• NEW LITHIUM ION BATTERY
ORDER CODE #600013

New! SOFTWARE: DesignCAD 2D Windows Version 7.0

USABILITY: *Custom tool collections and named macros win the usability crown.* ***
TECHNOLOGY: *Limited to 2-D elevations, but laden with features.* **
VERDICT: *The CAD low-price leader of the low end.* ***

DesignCAD Cleans Up Windows

In the realm of high-end CAD, Autodesk's AutoCAD is the king of the heap. Downscale a bit from this powerhouse are less-capable and much less expensive CAD programs such as AutoCAD LT ($495). Then there's DesignCAD 2D Windows, Version 7.0 from American Small Business Computers. At $349, it's even less expensive than AutoCAD, but in many ways, it's superior.

Despite its bargain-basement price, DesignCAD 2D Windows has an upscale feature set. It has the same excellent capabilities and BasicCAD programming language as its DOS ancestor, as well as several features new to this release. For example, you can now name up to 256 layers and choose object handles before selecting the command—much more intuitive than the old way.

Other additions include fixed-scale hatch patterns that don't change when you resize a drawing and a print preview that lets you adjust margins, scale and fit drawings, and even preview multipage documents.

Design Issues DesignCAD also lets you tailor the user interface with a nicely designed Options dialog box. Another big usability bonus is that any macros you make are now known by names instead of code numbers—at last.

But the most helpful feature—one that all CAD packages should implement—is the invaluable InfoBox. This dialog box pops up when you double-click on an object, and it displays everything DesignCAD knows about it. You inspect or modify any object attribute (color, line type, area, you name it) directly from the InfoBox.

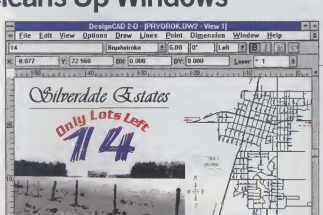
Like any CAD program, DesignCAD 2D Windows Version 7.0 uses DXF and IGES formats for exchanging drawings with other CAD programs—though it does not support the DWG format that's rapidly gaining acceptance. It also imports HPGL plot files and ASCII files containing *x*-axis and *y*-axis coordinates, and exports drawings in WPG format for WordPerfect.

There are some things this DesignCAD cannot do. It's not possible to load more than one drawing at a time, although you can merge files and open multiple views on the same drawing. And because it's purely 2-D, the program has no tools to aid you with orthographic or isometric drawing.

Moving Right Along Coming down the pike are a couple of new technological improvements that will likely affect your decision to buy DesignCAD 2D Windows.

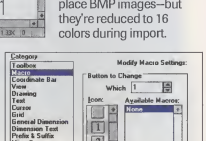
First, if the lack of DWG support is enough to keep your signature off the purchase order, don't hesitate long. Support is currently under development for a forthcoming product and will be introduced into DesignCAD 2D when it's ready. Second, the new product in development is a 3-D version of DesignCAD Windows. So if you really wanted 3-D and you were considering DesignCAD 2D Windows just to make the move to Windows, hold off until fall.

But if you don't need 3-D features or some of those high-end gizmos, then the low-priced DesignCAD 2D Windows Version 7.0 makes an excellent choice. **RALPH GRABOWSKI**



Looking Good: Want more than flat plans and wire-frame fonts? Use TrueType and PostScript fonts in DesignCAD 2D's drawings. Unlike fonts in AutoCAD LT, these look good and can be sized and placed along a curve. You can also place BMP images—but they're reduced to 16 colors during import.

Design Your Interface: DesignCAD 2D's Options dialog box lets you customize the program's interface. You can add macros or other frequently used commands to the toolbar or to other floating custom toolboxes. Just drag and drop the command icons where you want them. And at the top of everyone's wish list: macros on the toolbar. Just pick a macro from the included list, pick an icon, and you're on your way to task automation.



FILEBOX

DesignCAD 2D Windows Version 7.0

Minimum RAM: 2MB.

Hard-Disk Footprint: 3MB.

Key Improvements: Clean, usable interface, handy InfoBox, named macros, ability to open multiple views of a drawing, library of more than 500 symbols.

Imports: DXF, IGES, HPGL, ASCII.

Exports: DXF, IGES, WPG, PCX, GEM, PostScript.

$349
American Small Business Computers
(918) 825-7555
Reader Service No. 631

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

DELL LATITUDE XP
INTEL DX4 100MHz

$4799

BUSINESS LEASE: $173/MO.

- 9.5" ACTIVE MATRIX TFT COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY
- NEW LITHIUM ION BATTERY

ORDER CODE #600012

4

DX4 100 MHz processor to be exact—the fastest clock speed you can buy in a notebook.

DELL™

To Order, Call

800-545-9671

In Canada, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City, Call 800-228-7811

Keycode #11XDC

New! **SOFTWARE: Act 2.0 for Windows**

Keep Your Eye on the Ball

USABILITY: *Fast and powerful, yet easy to use for managing contacts and schedules.* ****
TECHNOLOGY: *Biggest shortcoming is lack of customizability.* ***
VERDICT: *Ease of use and e-mail integration make it a sound purchase.* ****

Business is a rough game. The rules aren't fair. But there are some secrets that can keep you one step ahead of the competition. Think of them as using your hands in soccer when no one's looking—only these secrets are legal.

We think everybody whose business is based on repeated personal contact with customers should use contact management software. It's an excellent way to make sure you always have control of the ball. One of the best is Symantec's Act 2.0 for Windows. The new version has a host of new features and greatly improved speed.

Track Record You can use Act in your day-to-day business life to track all of your interactions with people. It can record information on clients, maintain histories of your phone calls, even prompt you for follow-up calls. Act also lets you manage your schedule through an integrated calendar, write business letters with its integrated word processor, and maintain e-mail contact without having to leave the program. Yet it's still easy to use.

You'll most likely use two main screens with Act: the contact screen and the calendar screen. It's a snap to drag and drop between these two modules—for example, just drag a contact onto the calendar to schedule a lunchtime appointment. On any given day, the calendar lets you view both timed and timeless activities (such as scheduled appointments and to-do items), which is tough to do with PIMs such as Polaris's PackRat.

You can customize the individual fields on your contact screen, but you can't go beyond two pages of data per contact. Additionally, you can't see both pages at the same time, and we found it tedious to toggle back and forth between the two pages.

Getting Together Act now lets you define groups of contacts—a real boon for scheduling, e-mail, and performing mail merges. And with Delrina's WinFax Pro and your predefined groups, you can perform a fax merge (this is similar to a mail merge in your word processor, except that you fax documents rather than print them).

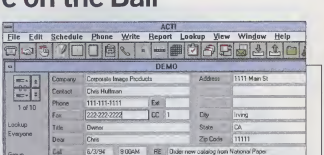
New to Act 2.0 is network and e-mail support. The program is now compatible with Novell's NetWare, Artisoft's LANtastic, and Microsoft's Windows for Workgroups. You can also integrate Act with cc:Mail and Microsoft Mail to easily send messages and attach any scheduled activity, such as a meeting. Despite network security, including individual passwords, log-in IDs, and three security levels, Act's network features still pale by comparison to its competitor, GoldMine (see "Keep Your Contacts in Place," June 1994, page 86).

Act's importing capabilities are much stronger in Version 2.0. To be specific, they really work. For example, if you add a number of contacts to your database while you're on the road, synchronizing that information with your existing database in the office is much more reliable than it had been in earlier versions.

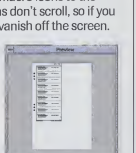
Act's icon bar could still use some work. Reduced from 19 to 17 unremovable buttons, it still doesn't leave much room for user-generated macros. If you add more macro buttons than it can display at one time, the icon bar doesn't scroll or grow a second tier—your macros simply vanish offscreen.

Act lets you print using the formats of popular schedulers, such as DayRunner, to take your information on the go. The only drawback to this is the print preview—the thumbnails are too tiny to let you distinguish between similar forms.

Despite these minor shortcomings, Act 2.0 for Windows is a fine product. Most outstanding is its ease of use. The program does lack some security features and resource management tools. But its network and e-mail enhancements make it a winning solution for corporate offices. BARRY BRENESAL



Individual Icons: The contact manager Act 2.0 for Windows lets you add your own macro icons to the button bar. But beware! The icons don't scroll, so if you have too many to display, they'll vanish off the screen.



Paltry Preview: You'll find new printing templates in Act 2.0 for envelopes and popular address books, welcome additions over Version 1.0. However, the thumbnail preview is so small, it's practically useless.

FILEBOX

Act 2.0 for Windows

Competitors: GoldMine, CrossTies, Maximizer, SuperOffice.

Requirements: Windows 3.1 or later, 4MB of RAM, 5MB of hard-disk space.

Import Options: dBASE or comma-delimited ASCII. Act now transfers DOS-based formats to Windows.

E-mail Support: cc:Mail, CompuServe, MS Mail.

Noteworthy: Manage your e-mail with the Briefcase.

$279.95; upgrade, $69.95
Symantec Corp.
(800) 441-7234, (408) 253-9600
Reader Service No. 612

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

DELL LATITUDE
INTEL DX2 50MHz SYSTEM

$2499

BUSINESS LEASE: $93/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 340MB HARD DRIVE
- $99 SECOND BATTERY (REQUIRED FOR 8 HOURS OF POWER)
- 1-YEAR WARRANTY

ORDER CODE #600010

A 3.3 volt processor in the new Latitude. Consumes fewer watts, pumps out hours of power, so you can cruise.

DELL™

To Order, Call

800-545-9671

In Canada, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City, Call 800-228-7811

Keycode #11XDD

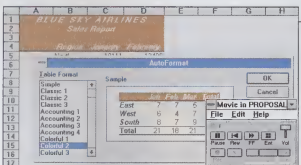
New! SOFTWARE: ScreenCam 1.1 for Windows

Moving Screen Shots That Talk

USABILITY: *Few features, but easy to learn.* ★★★
TECHNOLOGY: *Records voice and screen.* ★★★
VERDICT: *Fastest demo-maker on earth.* ★★★★

Here's how *not* to create in-house software training or demos: Hire a $50-an-hour programmer, put up with weeks of revisions, then trash the whole project when it turns out wrong. Instead, we recommend you invest in Lotus Development's ScreenCam 1.1 for Windows and do the whole thing yourself in less time than it takes to sign a programmer's contract.

ScreenCam records movies of screen activities, along with a soundtrack so you can explain what you're doing. The process is simple: Click on the Record button, start operating the software you want to demo, and record your voice-over at the same time. Then save the file in Lotus's proprietary ScreenCam Movie format and distribute it with the free run-time ScreenCam player. Alternatively, you can combine the player with the SCM movie to make a one-off, self-running executable file.



Screen, Camera, Action: Run ScreenCam movies from any OLE-aware application. This movie, embedded in an Excel document, is only a double-click away. To distribute a movie, use Lotus Notes or any e-mail package that can serve as an OLE client.

ScreenCam movies require lots of storage—up to 1.5MB per three minutes—and there's no way to compress a movie's soundtrack to shrink its file. In fact, about the only way to save disk space is to record at low VGA resolution and low color depth. Apart from ScreenCam's lack of file compression, its most significant drawback is that its SCM files cannot be edited. Future releases will probably address this problem, but for now it's like this: Make a mistake, start over. If the ability to edit your movies or record just part of the screen is important to you, try ScreenCam's competitor, Motion Works International's CameraMan 2.0 for Windows ($149). It creates Video for Windows AVI files that you can edit by using Adobe Premiere or another video editing program.

ScreenCam's appeal to technical support staff and computer instructors is clear. It doesn't get any easier than this—mainly because tricky movie editing isn't possible. YAEL LI-RON

FILEBOX

ScreenCam 1.1 for Windows

Requirements: A 386 with Windows 3.1 and 1.2MB of hard-disk space; a 486 is recommended for making recordings with adequate playback speed; sound card and microphone for audio I/O required.

$79
Lotus Development Corp.
(800) 343-5414
Reader Service No. 633

Multimedia Cloaking

Memory Management to Remember

USABILITY: *No user interface, no problems.* ★★★★
PERFORMANCE: *Regain 70K of memory.* ★★★★
TECHNOLOGY: *DOS-proof memory tricks.* ★★★★½
VERDICT: *All memory gain, no performance pain.* ★★★★

As memory managers have improved, RAM cram has given way to another memory lapse—upper-memory cram.

Helix Software has come to the rescue of your beleaguered upper memory with a set of three utilities geared to revving up multimedia systems. Multimedia Cloaking consists of a CD-ROM driver to replace Microsoft's MSCDEX, a disk cache like DOS's SmartDrive that also handles CD-ROM caching, and a small-footprint mouse driver. What's the big deal about a bunch of tools you got for free when you bought MS-DOS? All three of Multimedia Cloaking's tools take up only 8K of conventional memory and no upper memory at all. Apart from the tiny 8K rub, the rest of the utilities run under 32-bit protected mode in extended RAM.

In our tests of Multimedia Cloaking, we won back 22K more RAM under 640K and 50K more RAM in upper memory—more than 70K that DOS-based apps could use for themselves. And our informal tests of the disk cache support Helix's claims that its CD-ROM caching is faster than DOS 6.2's SmartDrive.

Best of all, the cloaking system isn't tied to any specific memory manager. The utilities worked with DOS's EMM386, QEMM-386, 386Max, and, of course, Helix's own Netroom.

On any system suffering from bloated CD-ROM drivers, the utilities in Multimedia Cloaking are keepers—until Chicago ships, anyway. And even then, there could still be a place for smart system management like this. RON WHITE

FILEBOX

Multimedia Cloaking

Utilities: CD-ROM driver (to supersede MSCDEX), disk and CD-ROM cache, mouse driver.

$39.95
Helix Software
(800) 451-0551; (718) 392-3100
Reader Service No. 634

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

DELL LATITUDE
INTEL SX 33MHz SYSTEM

$2098

BUSINESS LEASE: $78/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM
- 200MB HARD DRIVE
- SECOND BATTERY INCLUDED*
- 1-YEAR WARRANTY

ORDER CODE #600009

2 bays in the Latitude[2] let you plug in two four-hour NiMH batteries for a total of, yep, you guessed it, 8 hours of battery power.

DELL™

To Order, Call

800-545-9671

In Canada,* Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11XDE

#1 in the independent VeriTest Steeplechase Battery test.[1] In fact, the Dell Latitude XP destroyed the previous battery life record by almost 5 hours.

External expansion via our **Advanced Port Replicator** means your Latitude XP turns into a desktop when you get back to the office.

Hot swappable **Type II and III PCMCIA slots** and Dell configuration software let you swap most PCMCIA goodies at will.

19mm Integrated Trackball with palm rest works in tandem with XP's fold-down feet so your hands can rest easy while they're working hard.

New record

Dell Latitude XP 50MHz STN
Steeplechase: 17 hours, 5 minutes

Typical VeriTest Steeplechase Results[1]
[Testing with power management. Actual battery life will vary with configuration and usage.]

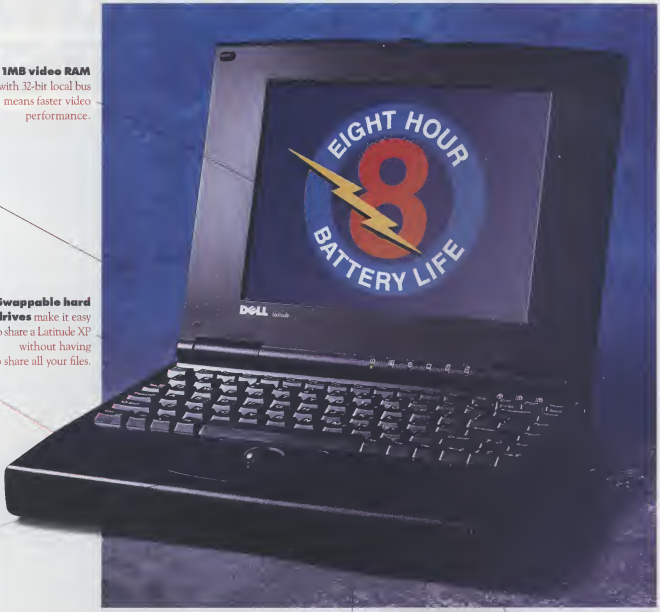
	hrs:mins
Compaq Contura 4/25c (SL/25) passive	4:32
IBM ThinkPad 755Cs (DX4/75) TFT	5:00
Toshiba T4800ct (DX4/75) TFT	5:30
IBM ThinkPad 500 (486/slc) mono	6:30
IBM ThinkPad 350C (SL/25) passive	8:50
Previous record for 486 mono	12:07
NEW RECORDS:	
Dell Latitude, 2 batteries DX2/50 STN	12:15
Dell Latitude XP DX4/100 TFT	14:48
Dell Latitude XP DX2/50 STN	17:05

No you've come down here to find out about this Steeplechase thing. Well, it's not a horse race, but a thorough test of battery life. The Steeplechase test includes mechanical typing, pausing, task switching and printing in MS Windows v3.1, MS Word for Windows v6.0 and MS Excel v5.0. All numbers represent an average of at least two trials with power management functions enabled. Test simulates executive usage, i.e. carrying notebook between meetings and intermittent use. Competitors' times are published in Portable Computing Magazine. For a complete copy of the VeriTest results, call our TechFax™ line at 800-950-1329. [2]This 3-year limited warranty consists of Dell's standard return-to-factory warranty during the first year, plus 1-year of next-business-day on-site service provided by Pancfic Service Corp. during the first year, plus a 2-year parts only contract for years 2 & 3. [3]Latitude XP is powered by one Lithium Ion battery. Latitude is powered by a NiMH battery, with the option of replacing the floppy drive with a second NiMH battery, which will increase the weight of the Latitude by 0.3 lbs. [4]Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices subject to change without notice. [5]Business leasing arranged by Leasing Group, Inc. *Intel and the Intel Inside logo are registered trademarks and DX4, DX2 and SX are trademarks of Intel Corp. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.*

intel inside

1MB video RAM with 32-bit local bus means faster video performance.

Swappable hard drives make it easy to share a Latitude XP without having to share all your files.



DELL LATITUDE XP
INTEL DX4 75MHz SYSTEM

$3399

BUSINESS LEASE: $126/MO.

- 9.5" DUAL SCAN STN COLOR
- 8MB RAM
- 340MB HARD DRIVE
- 3-YEAR WARRANTY
- NEW LITHIUM ION BATTERY
  ORDER CODE #600011

For programs requiring major RAM, we offer **RAM expansion up to 36MB** on Latitude XP.

CommWorks, RadioMail and America OnLine free and pre-installed so you never have to be out of touch.

DELL™

To Order, Call
800-545-9671

In Canada, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City, Call 800-228-7811

Keycode #11XDF

OVER TWO MILLION LOTUS
LIVES A LOT EASIER. THEY SW

Every day more people are jumping the fence to the most popular spreadsheet ever. In fact, over 10 million people are now taking advantage of the intuitive power of Microsoft® Excel.

The TipWizard™ assistant tracks your work and offers custom shortcuts.

It's just the smart thing to do. Microsoft Excel 5.0 is the only spreadsheet with built-in intelligence – our exclusive IntelliSense™ technology. So, like everything in the Microsoft Office, this program understands what you're doing and helps you get there with a lot less work. Simple tasks are automatic, more complex jobs are a breeze.

Say that you want to browse through all your data to find some sales totals. Click. AutoFilter shows you just what you want.

You can add those totals automatically with the Subtotal feature.

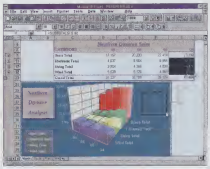
*Microsoft support is no-charge; however, normal telephone company charges may apply. Microsoft support services are subject to Microsoft's then-current prices, terms, and conditions, and subject to change without notice. Microsoft Ch
information only, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are deaf or hard of hearing can reach Microsoft text telephone (TT/TDD) services by calling
and Windows are trademarks of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of the Lotus Development Corporation.

USERS JUST MADE THEIR TCHED TO MICROSOFT EXCEL.

Then expand or collapse the details of your worksheet with the Outlining buttons. Instantly. Like no other spreadsheet can.

Think about the analysis you do. Only Microsoft Excel gives you such easy, powerful access to information. With our PivotTable™ Wizard, it's a cinch to pull your raw facts into a clear summary report.

Then, with the PivotTable dynamic views, you can look at data



Instantly update your charts with Drag-and-Plot. Just drag in new data and you're done.

from different points of view—by product, region, quarter, whatever. Just drag and drop different headings to rearrange your report. As you go, your figures are immediately recalculated. So you see them in a whole new way.

Of course, Microsoft Excel is another smooth-fitting piece of the Microsoft Office, where every program works together like one.

After creating a table or chart in Microsoft Excel, you can just drag and drop your work into Word.

Any time you want to make changes, one click puts all of your spreadsheet tools back in action. Without leaving your document.

It's this OfficeLinks integration that lets you focus on your work, not on finding the tools you need.

As a user of Microsoft Excel, you're getting the best support around. Furthermore, every program that's in the Microsoft Office comes with the only no-charge* product support that's unlimited.

And if you're a former Lotus® 1-2-3® user, relax. You can directly transfer files, even run existing macros. Easily. Enter a Lotus command and the Help for Lotus users feature lets you automatically see the Microsoft Excel equivalent.

So swing by your nearest dealer or call us at (800) 894-6642, Dept. 6SP. You'll see why the grass is greener on this side of the fence.

Microsoft Office

...sional, shown here, includes: Microsoft Excel, Word, the PowerPoint® presentation graphics program and the Microsoft Access® database management system. In the 50 United States, call (800) 894-6642, Dept. 6SP. In Canada, for ...94 in the United States or (905) 568-9641 in Canada. © 1994 Microsoft Corporation. All rights reserved. Microsoft, Microsoft Access, PowerPoint and the Windows logo are registered trademarks and IntelliSense, TipWizard, PivotTable

COLORADO TAPE BACKUP

Save At Any Speed.

Think of it as an airbag for your computer.

Data is your computer's most important passenger.

Think of all the time and money you have invested in creating and storing the information on your computer. Now think of what would happen if one day it all was lost. Let's face it. It's an imperfect world and accidents happen. Fires, floods, earthquakes, theft, power failure, hard disk crashes and just plain human errors can cause your valuable data to somehow disappear. Protect your investment by backing up your data regularly. with Colorado Tape Backup Solutions.

CAUTION! DATA ONBOARD

With capacities from 120 MB up to 4 GB, there's a solution that's right for you. Colorado Tape Backup is easy, fast, reliable and costs less than a comparable stack of floppy disks. And Colorado is recommended more than all other backup systems combined, earning dozens of industry awards. Save time. Save money. Save your computer's most important passenger: your data. Explore Colorado Tape Backup Solutions today.

Drive safely.

Complete Tape Backup Solutions

Call for more information and FREE literature

1-800-451-0897

Extension 730

PCC Best
PC Computing
BEST 200
June 1994

COLORADO MEMORY SYSTEMS
A Division of Hewlett-Packard Company

©1994 Colorado Memory Systems. All Rights reserved. Colorado and Jumbo are trademarks of Colorado Memory Systems. All other trademarks are property of their respective companies. CRA2/94

Circle 184 on reader service card.

LANstep 2.0

One Step Forward, One Step Back

LANstep 2.0 is Hayes Microcomputer's bold attempt to break the boundaries of traditional PC networking. Neither completely peer-to-peer like Artisoft's LANtastic nor server-based like Novell's NetWare, it's an unorthodox combination of some of the best features from both worlds. But its implementation requires a little too much commitment to its clever architecture for us to recommend it wholeheartedly.

LANstep acts like a peer-to-peer network in that your primary and any secondary servers don't theoretically have to be dedicated to the task. However, in practice you'll find you get the best results from dedicating at least the primary server. It may be counter to Hayes's philosophy of network services, but LANstep servers are highly resource-intensive compared to other peer-to-peer networks, hogging not just 50K of conventional RAM but also 1.5MB of extended memory.

Name Calling You may be willing to forgive this resource gluttony in light of the fact that LANstep is the only low-end NOS that implements directory services: Instead of having to log on to individual servers, users simply log on to the network, call up resources by logical names, and LANstep connects them to the right server.

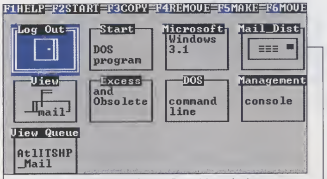
LANstep has a unique design—on the primary server, you actually need to load the LANstep operating system before DOS. This means that an administrator must know both LANstep and MS-DOS well. For instance, to evaluate a server's hard-drive capacity, Hayes recommends that you boot the server with a DOS floppy and use FDISK and CHKDSK. On the other hand, LANstep eschews the centralized server model by decentralizing file security. Rather than using an access control bindery (like NetWare) that can be destroyed or hacked into, LANstep embeds the access rights for each file into the files themselves.

Hard to Handle Getting LANstep to work with network applications or with other networks can be difficult. While it supports NetBIOS applications, you must manually edit a workstation's PROTOCOL.INI file to turn on this support. LANstep supports Ethernet, ARCnet, and Token Ring network interface cards—in fact, any card with support for Network Driver Interface Specification (NDIS). You can even run other protocols under LANstep, such as NetWare's IPX. But that feature is cumbersome to set up, and even Hayes admits that LANstep is not the ideal choice for a workgroup that needs to be integrated into a larger heterogeneous network.

Nor is this network a good choice for Windows-centric users. LANstep's GUI-like, character-based interface is a throwback to the menu systems of the mid-1980s, and is woefully inadequate. If you move from one "icon" to another with the cursor keys, for example, you must also cursor through empty spaces that don't contain icons.

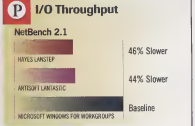
LANstep may be a different approach to an old idea, but then again, so was the new Coke. It has some notable advantages—distributed security and dynamic menus among them—but ultimately LANstep is not as useful a solution as either the client-server or peer-to-peer model it's trying to supplant.

STEVEN J. VAUGHAN-NICHOLS



Looks Aren't Everything: Sure it's ugly, but Hayes's LANstep network dynamically updates its DOS-based interface as you add and remove resources. While you have to use this interface for network management, you can use Windows' File Manager to access shared network directories.

Keeps Pace: Performance isn't the issue with LANstep. It's about as fast as Artisoft's LANtastic. On the other hand, it uses far more system resources.



USABILITY: *Interface is neither intuitive nor fast.* **
PERFORMANCE: *Comparable to most peer networks.* ***
TECHNOLOGY: *Has directory services . . .* ****
VERDICT: *. . . but you have to sacrifice to get them.* **

FILEBOX

LANstep 2.0

Server Memory Requirements: 50K of conventional memory, up to 1.5MB of extended memory.

Client Memory Requirements: 9K to 120K.

Primary File-Server Hard-Disk Footprint: 20MB.

Secondary Server Hard-Disk Footprint: 1MB.

Client Hard-Disk Footprint: 250K.

$595 (five users)
Hayes Microcomputer Products
(404) 441-1617
Reader Service No. 636

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

New! NETWORKING
EtherWave and Silver Streak

Get Your Next LAN In a Can

Looking to create a portable network quickly? Now there are two alternatives to small hubs and thin Ethernet cable: Farallon Computing's EtherWave and Tut Systems' Silver Streak. These two products let you daisy-chain Ethernet nodes together with 10Base-T cable or phone wire, respectively.

Farallon's EtherWave transceivers are small squares, about three inches on a side and one inch thick. Each $129 unit connects to a PC with a 10Base-5 (thicknet) connector, and there are two RJ-45 ports to link it to 10Base-T (twisted-pair) wires. You can daisy-chain up to eight devices over 10Base-T, one of which can be a network hub (which effectively turns one hub port into eight). You're limited to a total cable length of 100 meters (about 328 feet)—10Base-T's standard length limit.

Bright Lights: Silver Streak (left) and EtherWave (right) both sport convenient LEDs.

Tut's $99 Silver Streak connector works on a similar principle but uses regular four-wire telephone cable and can daisy-chain up to 30 devices with a total cable length of 185 meters (approximately 607 feet). You can't connect it directly to a hub, however, and it requires that you terminate any open sockets with a small but easy-to-lose plug that Tut provides.

Both products make it possible to quickly cable together workstations. We tested them with a variety of Ethernet cards from 3Com, Intel, Compaq, Cabletron, and Socket. Network performance was unimpeded over the products as well.

Farallon and Tut have interesting solutions for small, portable LANs, and with Silver Streak starting at $99 and EtherWave at $129, they offer an inexpensive way to connect two or three computers. Because Silver Streak lets you string together up to 30 nodes and costs less than $100 per node, we'd choose it over EtherWave. But prices for eight-port 10Base-T Ethernet hubs start around $200. If you already have 10Base-T Ethernet cards, it may be less expensive to purchase a small, mobile hub than to outfit four to eight nodes with these transceivers.

Although the technology is interesting, we found that these products weren't really superior in terms of price or performance to existing physical layer solutions. However, if you haven't already invested in hubs or thin Ethernet, EtherWave and Silver Streak make for good, easy-to-use alternatives for smaller networks. JOHN MONTGOMERY

EtherWave

USABILITY: *Easy to daisy-chain workstations.* ★★★
TECHNOLOGY: *Still relies on 10Base-T wire.* ★★★
VERDICT: *Not as flexible or inexpensive as Silver Streak.* ★★★

Silver Streak

USABILITY: *Very simple installation.* ★★★
TECHNOLOGY: *Runs full-tilt Ethernet over cheap phone wire.* ★★★½
VERDICT: *Low cost, easy-to-use alternative to 10Base-T.* ★★★★

FILEBOX

EtherWave AUI Transceiver

$129
Farallon Computing
(510) 814-5100
Reader Service No. 637

Silver Streak AUI Connector

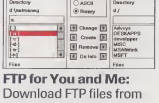
$99
Tut Systems
(800) 998-4888, (510) 682-6510
Reader Service No. 638

Internet Membership Kit

Training Wheels for the Infobahn

You say you want to join the Internet community but don't know where to start? Get yourself a modem or direct Internet connection and a copy of Ventana Media's Internet Membership Kit. For $70, Ventana's kit includes everything you need to send and receive e-mail and access any of the thousands of newsgroups worldwide.

Ventana includes two of the best Internet books around to get you started: *The Internet Yellow Pages* (Osborne, McGraw-Hill, 1994) and *The Windows Internet Tour Guide* (Ventana Press, 1994).



FTP for You and Me: Download FTP files from the Net using Ventana's Internet Membership Kit.

While these resource guides are excellent, the software leaves you hungry for more. Ventana bundles a sample of NetManage's Chameleon Sampler and a TCP/IP stack necessary for establishing a node on the Net, but the e-mail reader and news reader are nothing more than functional.

Ventana Press's great books make this kit worth considering. We just wish it included more (and better) software. Still, if you're new to the Net, the Internet Membership Kit is worth the price of admission. JOHN TASCHEK

USABILITY: *Scaled-down programs are a snap to use.* ★★★
TECHNOLOGY: *Chameleon's TCP/IP stack supports both dial-up and direct Net access.* ★★★★
VERDICT: *Worth it for the books alone.* ★★★

FILEBOX

Internet Membership Kit

Competition: Dozens of similar Net books.

$89.95
Ventana Media
(800) 209-3342, (919) 942-0220
Reader Service No. 639

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Your Life.

Your Life Simplified.

Introducing Sidekick for Windows.
Finally, a card file, calendar, to-do list and note pad in one easy application that's so fast and functional, it can actually simplify your life.

Click on the Quick Menu button and Sidekick pops up on screen instantly. From any application.

New Sidekick speeds you to your important information unlike any personal organizer you've ever seen. Just click on its Quick Menu button from inside WordPerfect, Quattro Pro, or *any* other Windows application, and you can set appointment reminders, jot down to-do lists, call up phone numbers and addresses and more, instantly.

So don't wait to get organized. Try Sidekick for the special introductory price of only $34.95* on our 90-day money-back offer. And see how simple it is to simplify your life.

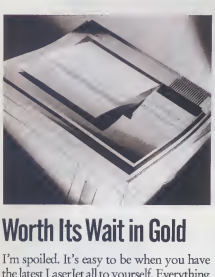
See your dealer or call
1-800-336-6464 Ext. 8956
(1-800-461-3327 in Canada)

Sidekick®
for Windows

Simplify™ *Software to Simplify Your Life. From Borland.* * Retail prices may vary. Includes $5.00 shipping and handling when ordering direct from Borland. Copyright © 1994 Borland International, Inc. All rights reserved. Simplify and Sidekick are trademarks of Borland International, Inc. BI-7528

Circle 113 on reader service card.

Logbook LONG-TERM TESTS: HP LaserJet 4 Plus • Ecco Professional



Worth Its Wait in Gold

I'm spoiled. It's easy to be when you have the latest LaserJet all to yourself. Everything about the LaserJet 4 Plus—its speedy 12-page-per-minute engine, excellent output quality, and affordable price—makes my printing painless. Unlike other printer technologies, laser is worth its upkeep cost—you'll never spend more than a few pennies per page, no matter what you're printing.

But here's the rub: While I'm a hardcore environmentalist, I hate the LaserJet's Power Save mode, which shuts down the printer's fuser when you haven't used it for a given amount of time. Don't get me wrong—I don't want a printer keeping itself warm for hours on end while I polish a story. But I'm not fond of twiddling my thumbs for the full minute it takes to warm up when I'm printing something I need for a meeting that started five minutes ago. Fortunately, you can turn off the Power Save feature—but my guilty conscience won't let me.

The printer "tells" me when I'm out of paper or when the front cover is open through bidirectional parallel communication. Unfortunately, this doesn't work on a LAN, and when I'm sitting right next to the printer, I'm annoyed when it points out the obvious. Fortunately, this is another option that can be turned off.

I'm ready to give the LaserJet 4 Plus a permanent home. If you need fast, reliable, great-looking output on or off a network, you should, too. KYLA K. CARLSON

LaserJet 4 Plus / Hewlett-Packard / (800) 752-0900 / $1,839
Circle No. 641 on Reader Service Card

Logbook Entries:

May 2, 1994: *I'm the envy of all in the office with my LaserJet 4 Plus laser printer. Granted, 12 pages per minute is more speed than one person needs, but what's a few ppm among friends?*

May 4,1994: *A powerful printer with a neat concealed paper tray. I'm glad a printer this big doesn't waste more desk real estate than necessary.*

June 13, 1994: *Fabulous 600-by-600-dpi output! I can squeeze oodles of small type into a spreadsheet and still read it without my glasses.*

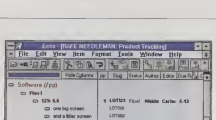
June 21,1994: *I don't need the online documentation often, but when I do, I'm stymied—it's cryptic and too technical to be user-friendly.*

Logbook Entries:

May 20, 1993: *The beta version of Ecco Profesional 1.0 arrives. Finally, a PIM that thinks the way I do: in lists. Slowly.*

July 12, 1993: *Ecco Professional 1.0 is officially released. It's still more workhorse than thoroughbred, but there's no competition if you're willing to sacrifice speed for features. And I am.*

April 20, 1994: *The new Ecco Professional 2.0 sports a great synchronization feature that keeps multiple versions of my main data file in lockstep between my office, home, and portable PCs. Also, new network support lets me use Ecco to read and handle meeting requests that come to me over Schedule+. Cool!*



Hooked on Ecco

I think in lists. I live in outlines. Ordinary PIMs don't do much for me. Most are underpowered, and they try to make up for it with childish little trash cans, bit-mapped binder rings, and other interface flotsam that clutter instead of organize.

Not Ecco Professional. I started using the program more than a year ago, and I still like it. I began moving my life into Ecco Pro shortly after 1.0 came out, and I'm up to 900K of data in my main file. The core of my information base is a mega-outline that tracks the products we cover, author and editor assignments, deadlines, and test schedules. No other PIM could handle this kind of data, and no database has Ecco's great drag-and-drop interface to move projects around.

Ecco also has the most easily modifiable toolbar of any Windows product. That, combined with its flexible column views, has let me create a highly customized work environment that really makes life easier. The one thing I don't like about Ecco is that not everybody feels the same way about it as I do. (Comments from co-workers range from "inflexible" to "slow.") Thus, its workgroup features go to waste, since there's nobody to share with. At least for group scheduling I can use Ecco's hooks into Schedule+.

Ecco Professional is a little slow and it's a resource hog, but I've lived through four upgrades of the product, and every revision has been leaner than the one before. I'm a convert: Ecco Professional is part of my life. RAPHAEL NEEDLEMAN

Ecco Professional 2.0 / Arabesque Software / (800) 457-4243 / $279
Circle No. 642 on Reader Service Card

PHOTOGRAPH BY ARNOLD TIOSE JD

BEFORE YOU BUY A
COMPUTER,
WE'D LIKE TO SELL YOU A
COMPANY.

IN ORDER TO BUILD AFFORDABLE, WE ASSEMBLED

When you buy a computer, you're buying more than just the computer itself. You're also buying the company.

As you look beyond speeds and feeds—and of course, price, price, price—what are you getting? Are the systems reliable? Does the company stand behind their products? Will they even be in business a few years from now?

These are the same considerations that guided us when we created AMBRA,™ the direct-order personal computer company.

OUR COMPANY—A CAREFUL ASSEMBLY OF ROCK-SOLID COMPONENTS.

In a sense, putting our company together was not unlike building a computer. As a nimble, entrepreneurial company, we're able to look at processes rather than departments. Every aspect of our product design, manufacturing, vendor selection, quality control, product testing and customer service is carefully constructed to work as an efficient, interdependent part of a larger, integrated system.

What's more, we continually look for ways to improve all of these processes—all to bring you consistent, reliable computing, from the moment you take an AMBRA system out of the box.

AN OPTIMIZED DESIGN IS JUST THE BEGINNING.

The development of every AMBRA system starts with a simple question: What can we do to bring better computing to today's power-hungry PC users?

Our in-house engineering staff and product development experts constantly assess the evolving needs of both people and businesses. Based on these needs, we then develop system designs that fully exploit and optimize the power of the latest technologies.

THE COMPONENTS OF CHOOSING A SUPPLIER.

We scrupulously examine our potential vendors—for quality, technology and value. We inspect their manufacturing sites. We use reputable suppliers—such as Intel,® IBM® and Western Digital. We test the components in-house—for ruggedness, compatibility and our own demanding benchmarks.

Once we've established a successful partnership with a supplier, we continue to use them as the single source for that particular component. In the long run, this helps us ensure consistency, quality and compatibility.

YOU CAN'T MANUFACTURE THIS LEVEL OF QUALITY.

Next, we send our qualified components to our integrator and manufacturer. Since 1982, they've manufactured over 24 million PCs for demanding clients known for their insistence on delivering quality.

This facility is ISO 9000 certified, which

ASSEMBI

90MHz, REAL POWER, REAL-TIME VIDEO.

"With the AMBRA DP90PCI, AMBRA...has developed a machine that offers excellent performance at a reasonable price." — *PC Magazine, June 28, 1994*

With its superscalar architecture and an enhanced floating-point unit, the Pentium processor sets the performance standard (up to 150 MIPS). The Intel Pentium 90MHz processor combined with PCI local bus architecture, makes the AMBRA 90MHz mini-tower ideal for resource-intensive applications—such as multimedia, 3D graphics and statistical modeling. What's more, it protects your investment—it's upgradable, expandable and runs over 50,000 X86 applications. All this, along with the greatest number of PCI options and features, enables you to create the most powerful PC ever.

intel inside pentium™ PROCESSOR

90MHz INTEL PROCESSOR *delivers industry-leading processing speeds up to 147% faster than a 486DX2/66MHz.*

256KB L2 WRITE-BACK CACHE *boosts performance above the integrated 16KB internal on-chip cache.*

VIDEO OPTIONS UP TO 32 MILLION WINMARKS. *PCI video options provide up to 32.1 Winmarks (4.0).*

PCI-SCSI-2 OPTION (EXPANDABLE TO 8GB) *allows you to store an enormous amount of data and advanced applications.*

SPECIALIST TSENG LABS

90MHz PENTIUM STANDARD FEATURES

- ▲ Intel 90MHz Pentium CPU
- ▲ 64-bit CPU-Memory-Cache Data Path
- ▲ 256KB L2 & 16KB L1 Cache
- ▲ Fast 32-bit PCI/IDE Controller
- ▲ 4 ISA, 2 PCI & 1 ISA/PCI Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 6 Drive Bays
- ▲ Lexmark™ 101-Key Keyboard
- ▲ MS-DOS® 6.2, Windows™ 3.1, Mouse
- ▲ One-Year IBM Onsite Service

1 DP90PCI *NOW* $2899

Business Lease: $103/Month

- ▲ Intel 90MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar™ Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM
- ▲ PCI Graphics Accelerator 2MB DRAM

2 MediaPro™ 90 *NOW* $3599

Business Lease: $128/Month

- ▲ Intel 90MHz Pentium CPU
- ▲ 16MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM Drive
- ▲ 16-bit Sound Card & 2 Speakers
- ▲ **TrueVideo™ Capture Board** with Tseng Video Image Processor

3 MediaPro 90T *NOW* $3999

Business Lease: $142/Month

- ▲ Mini-Tower Chassis
- ▲ Intel 90MHz Pentium CPU
- ▲ 16MB RAM, Max: 128MB
- ▲ 1.4GB (2x720MB Enhanced IDE Caviar Hard Disk Drives)
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Double-Speed Multisession CD-ROM Drive
- ▲ 16-bit Sound Card & 2 Speakers
- ▲ **TrueVideo Capture Board** with Tseng Video Image Processor

TRUEVIDEO

- ▲ Connects to Standard Camcorders & VCR
- ▲ Video Capture of Still & Motion Video
- ▲ Comes with Video for Windows,™ & Intel Indeo™ Compression

Versatile Performer

- ▲ High-Performance Graphics & Video
- ▲ Capture & Import Directly into Windows Applications
- ▲ Perfect "Color Scanner" for Presentations, Image Databases

Fast, Powerful Image Processing

- ▲ Ultra-Smooth, Jitter-&-Stagger-Free Live Video
- ▲ Video Acceleration of Clips from CD-ROM & Hard Disk
- ▲ 31 Million Winmarks 4.0 at 1024x768, 256 Colors, at 70Hz

Lifelike Display

- ▲ NI Display of Up to 800x600 (16 Million Colors) or 1280x1024 (256 Colors)
- ▲ Stretch Images Up to 1200 Times with No Loss of Image Quality
- ▲ Selectable Refresh Rates of 30 Frames/Sec, 60 Fields/Sec, or 30 Fields/Sec

LED HERE ARE OUR

PENTIUM POWER STARTS AT $1899.

"The AMBRA Pentium PCI Desktop makes it clear that this is the new Windows/Multimedia system standard."
—Windows Sources, April 1994

With this much power at your fingertips, you'd think you were sitting at a workstation. Because now the affordable AMBRA Pentium desktop has arrived. It brings you the latest in personal computer technology; a Pentium 60MHz microprocessor with PCI local bus. Standard features included are 256KB L2 and 16KB L1 caches, a 64-bit CPU-memory-cache data path, a high-performance floating-point unit, a fast 32-bit PCI/IDE controller, and a system RAM that is expandable to 128MB and compatible with over 50,000 X86 applications. This combination of performance and compatibility positions the AMBRA Pentium 60MHz systems to meet the needs of the emerging wave of new 32-bit applications and next generation operating systems.

intel inside pentium™ PROCESSOR

The AMBRA DP60PCI System, InfoWorld, March 14, 1994

60MHz INTEL PROCESSOR *delivers 100 MIPS with its superscalar, dual-pipelined, enhanced floating-point architecture, increasing your overall productivity.*

PCI LOCAL BUS GRAPHICS ACCELERATOR *options provide a 32-bit or 64-bit graphics engine—ideal for demanding GUI-based applications.*

PCI/IDE DISK CONTROLLER *increases performance by using 32-bit disk access reaching transfer rates up to 11MB/sec (vs. 2MB for standard IDE transfers).*

Accordingly the finest™ Caviar
WESTERN DIGITAL

60MHz PENTIUM PCI STANDARD FEATURES

- ▲ Intel 60MHz Pentium CPU
- ▲ 64-bit CPU-Memory-Cache Data Path
- ▲ 256KB L2 & 16KB L1 Cache
- ▲ Fast 32-bit PCI/IDE Controller
- ▲ 4 ISA, 2 PCI & 1 ISA/PCI Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 6 Drive Bays
- ▲ Fast Serial Ports—16550 UART
- ▲ Enhanced Parallel Port—ECP/EPP
- ▲ Lexmark 101-Key Keyboard
- ▲ MS-DOS 6.2, Windows 3.1, Mouse
- ▲ One-Year IBM Onsite Service

4 DP60PCI
NOW $1899
Business Lease: $68/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 420MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 1MB DRAM

5 DP60PCI
NOW $2199
Business Lease: $78/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 540MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 2MB DRAM
- ▲ Double-Speed Multisession CD-ROM Drive

6 DP60PCI
NOW $2299
Business Lease: $82/Month

- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Diamond Viper PCI Graphics Accelerator 2MB VRAM

LIMITED QUANTITIES

Order any system with a CD-ROM drive and upgrade to multimedia with a 16-bit sound card and 2 stereo speakers for $49 (offer expires 9-30-94).[1]

HIGH-PERFORMANCE COMPUTERS, THE COMPANY FIRST.

means stringent adherence to an established procedure of quality checks, documentation and reporting. Checks along the manufacturing line include assembly verification, initialization wake-up testing, and automatic functional testing for every system.

CHECKS AND RECHECKS.

Our in-house engineering staff performs full component-level and manufactured system evaluations and release tests. Even the packaging is tested.

What's more, every new AMBRA system receives XXCAL Gold Certification, as well as FCC, UL and CUL certification.

We continue to monitor and evaluate every aspect of the entire design and manufacturing process, to deliver more powerful, more reliable personal computing.

As testimony to our success, our products have received numerous glowing reviews and "Best Buy" endorsements. Among them, *InfoWorld, PC World, Windows Sources, PC Week* and *PC Magazine*.

WE'RE RIGHT THERE—WITH ROCK-SOLID SERVICE AND SUPPORT.

After we sell you a computer, we stand behind every purchase. In fact, we've enlisted the best support in the industry. Every system we sell is backed by toll-free IBM technical service, 24 hours a day, 7 days a week. And for desktops and mini-towers, IBM onsite technical service is included. Finally, if you're not completely satisfied, return your purchase within 30 days, and we'll give you your money back. Period.

At AMBRA, we're committed to you, our customer. We'll always be there when you need us—now and in the future.

PENTIUM POWER STARTS AT JUST $1899, THE FASTEST 486DX2 EVER IS ONLY $1599, AND OUR 75MHZ DX4 NOTEBOOK IS ONLY $2899.

We do more than just promise high-powered, low-priced computing. We're ready to deliver—today.

In the pages that follow, compare our reliable, leading-edge technology. Pentium™ desktops and mini-towers, optimized I/VLs and powerhouse notebooks, among others.

Compare our prices—the lowest ever. And when it comes to our reliable service and support, there is no comparison.

Compare, and you'll be sold on our computers—and our company.

AMBRA

ER.

THE ULTIMATE NOTEBOOK.

"...their ergonomic design and attractive features go a ways toward differentiating them from the throng of notebook PCs available." —*PC Week, May 9, 1994*

Powered by a fast Intel DX4/75MHz processor, the N75D sets a new standard for notebooks. The 10.3-inch dual-scan color display screen is sharp and vivid. With integrated audio playback/record, your multimedia presentations will be very powerful. And with an ergonomically designed wrist-rest and a long-lasting NiMH battery, you'll work comfortably for hours. It'll fit comfortably within your budget, too.

N75D-340
PC World,
August 1994 Issue

The AMBRA
N75D-340,
InfoWorld,
May 23, 1994

A 9.5" TFT ACTIVE MATRIX COLOR OR A 10.3" DUAL-SCAN DSTN COLOR DISPLAY *lets you view sharp, vivid graphics.*

SYSTEM STATUS PANEL *lets you monitor battery life, disk drive activity, suspend/resume and more.*

ERGONOMIC KEYBOARD WITH AN INTEGRATED 16MM TRACKBALL *makes data entry quick and comfortable.*

340MB UPGRADABLE HARD DISK *enables you to store tons of data and virtually all kinds of advanced applications.*

INTEGRATED ADVANCED AUDIO *playback and edit functions give your multimedia presentations impact. Or use the record capability through the inline jack.*

STANDARD NOTEBOOK FEATURES

- ▲ Integrated Audio (Speaker and Microphone)
- ▲ Centered 16mm Trackball
- ▲ System Status Panel
- ▲ 4MB RAM, Max: 20MB
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ Type III PCMCIA Slot (1 Type III/ 2 Type II)
- ▲ 85-Key Keyboard
- ▲ MS-DOS 6.2
- ▲ Windows for Workgroups® 3.11
- ▲ 6.7 Pounds, Including NiMH Battery
- ▲ Includes AC Adapter and Case

10 N75D-340

NOW $2599

Business Lease: $92/Month

- ▲ 75MHz Intel DX4
- ▲ 340MB Hard Disk Drive, Upgradable
- ▲ 10.3" Dual-Scan DSTN Color Display with Local Bus Video and 1MB Video RAM

11 N75T-340

NOW $3499

Business Lease: $124/Month

- ▲ 75MHz Intel DX4
- ▲ 340MB Hard Disk Drive, Upgradable
- ▲ 9.5" Active Matrix TFT Color Display with Local Bus Video and 1MB Video RAM

12 N100T-450

NOW $3699

Business Lease: $131/Month

- ▲ 100MHz Intel DX4
- ▲ 450MB Hard Disk Drive, Upgradable
- ▲ 9.5" Active Matrix TFT Color Display with Local Bus Video and 1MB Video RAM

N100 AND N75 OPTIONS

▲ 4MB Memory	$249
▲ 8MB Memory	$449
▲ 16MB Memory	$1149
▲ NiMH Battery	$139
▲ Battery Charger	$99
▲ 2.4/9.6 kbps Data/Fax Modem	$169
▲ 14.4 kbps Data/Fax Modem	$259
▲ 12Volt DC Auto Adapter	$79
▲ AC Adapter	$89
▲ Docking Station	$399
▲ Deluxe Carrying Case	$99
▲ New ClidePoint®	$89
▲ N100T/N75T Extended Warranty	$349
▲ N75D Extended Warranty	$299

intel inside

CALL NOW 1800-200-3195

AMBRA

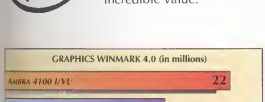
LOWEST PRICES EV

THE FASTEST 486 EVER IS NOW EVEN FASTER.

"...the D466 I/VL (is) the fastest 486DX2/66 we've ever tested."
—InfoWorld, April 4, 1994

See for yourself. This is one powerful PC. In fact, video performance is now 20% faster with new Tseng W32p video drivers. Add higher performance through VESA® IDE, VESA graphics and enhanced parallel ports. Add investment protection with an upgrade path to Pentium technology and PCI. For expandability, there are 5 expansion slots and 5 drive bays in the desktop model; 8 expansion slots and 6 drive bays in the mini-tower, graphics upgradable to 2MB, providing True Color at 800x600 resolution. At this price, it all adds up to an incredible value.

intel inside



UPGRADABLE TO PCI. *Switch to PCI expansion slots by upgrading the riser card and flashing the BIOS.*

TRUE COLOR. *Increased color depth to meet or exceed today's demanding multimedia applications—supports 800x600 True Color.*

FAST SERIAL PORTS. *Two 16-bit high-speed serial ports use a fast 16550 UART. The FIFO buffer allows continued serial communication while the CPU is processing other data.*

ENHANCED PARALLEL PORT (ECP/EPP) *increases print performance from 200KB/sec to 2MB/sec—in simple terms, 133 times faster.*

I/VL DESKTOP STANDARD FEATURES

- ▲ Upgradable to PCI & Pentium Technology
- ▲ 256KB Write-Back L2 Cache
- ▲ Tseng W32p VESA Graphics Accelerator—1MB, Upgradable to 2MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 4 16-bit ISA & 1 32-bit VL Bus Slots
- ▲ 3.5" 1.44MB Diskette Drive
- ▲ 5 Drive Bays
- ▲ Lexmark 101-Key Keyboard
- ▲ MS-DOS 6.2, Windows 3.1, Mouse
- ▲ Upgrade to Mini-Tower $75
- ▲ One-Year IBM Onsite Service

7 D466 I/VL
NOW $1599

Business Lease: $57/Month

- ▲ 486DX2/66MHz Processor
- ▲ 4MB RAM, Max: 64MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)

The AMBRA D466 I/VL InfoWorld, April 4, 1994

8 BEST BUY D466 I/VL
NOW $2299

Business Lease: $82/Month

- ▲ 486DX2/66MHz Processor
- ▲ 8MB RAM, Max: 64MB
- ▲ 540MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ 16-bit Sound Card & 2 Speakers
- ▲ Borland Office™ on CD:[4] (WordPerfect,® Quattro® Pro & Paradox®)
- ▲ Productivity Pack on CD:[5] PhoneDisc USA Business Macromedia Action! SE Macromedia Authorware SE Clipmedia2 Business & Industry

9 BEST BUY D4100 I/VL
NOW $2299

Business Lease: $82/Month

- ▲ 100MHz Intel DX4 Processor
- ▲ 16KB L1 Cache
- ▲ 8MB RAM, Max: 64MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)

TSENG LABS

WE COULD GO ON AND ON.

All AMBRA Desktops and Mini-Towers Feature:

- ▲ *Upgrade Path to Pentium Technology*
- ▲ *3.5" 1.44MB Diskette Drive*
- ▲ *Lexmark 101-Key Keyboard*
- ▲ *MS-DOS 6.2*
- ▲ *Windows 3.1*
- ▲ *Mouse*
- ▲ *One-Year IBM Onsite Service*

486 DESKTOP SYSTEMS

13 486SX/33MHz
NOW $1299

Model D4335XA
Business Lease: $46/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 4MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ S ISA Slots & S Drive Bays

14 486DX2/50MHz
NOW $1369

Model S450DX
Business Lease: $49/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 4MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ 2 VESA & 1 ISA Slots
- ▲ 3 Drive Bays

15 486DX2/66MHz
NOW $1599

Model D466DXA
Business Lease: $57/Month
- ▲ 128KB L2 Cache, Max: 256KB
- ▲ 8MB RAM, Max: 36MB
- ▲ 212MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ S ISA Slots & S Drive Bays

UPGRADABLE BUS MODEL

16 486DX2/66MHz
NOW $1799

Model D466 I/VL
Business Lease: $64/Month
- ▲ 256KB L2 Cache, Write-Back
- ▲ 8MB RAM, Max: 64MB
- ▲ 270MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ Tseng W32p VESA Local Bus Graphics Accelerator 1MB
- ▲ VESA Local Bus IDE Hard Drive Controller
- ▲ 4 16-bit ISA & 1 32-bit VL Bus Slots
- ▲ S Drive Bays

InfoWorld, April 4, 1994

PENTIUM/PCI's

17 60MHz PCI
NOW $1899

Model DP60PCI
Business Lease: $68/Month
- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 420MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 1MB DRAM

18 60MHz PCI
NOW $2299

Model DP60PCI
Business Lease: $82/Month
- ▲ Intel 60MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Diamond Viper Graphics Accelerator 2MB VRAM

19 90MHz PCI
NOW $2899

Model DP90PCI
Business Lease: $103/Month
- ▲ Intel 90MHz Pentium CPU
- ▲ 8MB RAM, Max: 128MB
- ▲ 720MB Enhanced IDE Caviar Hard Disk Drive
- ▲ Double-Speed CD-ROM Drive
- ▲ 15" FST-NI Color Monitor-LR (13.6" viewable screen size)
- ▲ PCI Graphics Accelerator 2MB DRAM

Add a Double-Speed Multisession CD-ROM Drive, 16-bit Sound Card and 2 Speakers to Any System, for $198.

Ask About Our CD 5-Pack Specials for $79.

MOBILE SYSTEMS

20 486SX/33MHz
NOW $1699

Model N433C-120
Business Lease: $60/Month
- ▲ 4MB RAM, Max: 12MB
- ▲ 120MB Hard Disk Drive
- ▲ 9.5" Dual-Scan Color Display
- ▲ 1 Type III PCMCIA Slot
- ▲ 3.5" Diskette Drive
- ▲ 86-Key Keyboard
- ▲ Integrated 16mm Trackball
- ▲ 6.6 Pounds, Including Battery
- ▲ Carrying Case
- ▲ MS-DOS 6.2, Windows 3.1
- ▲ Borland Office (WordPerfect, Quattro Pro and Paradox)*
- ▲ New Sidekick® for Windows

21 486DX2/50MHz
NOW $2999

Model N450T-200
Business Lease: $106/Month
- ▲ 8MB RAM, Max: 12MB
- ▲ 200MB Hard Disk Drive
- ▲ 9.5" Active Matrix TFT Color Display
- ▲ 1 Type III PCMCIA Slot
- ▲ 3.5" Diskette Drive
- ▲ 86-Key Keyboard
- ▲ Integrated 16mm Trackball
- ▲ MS-DOS 6.2, Windows 3.1
- ▲ 6.6 Pounds, Including Battery
- ▲ Carrying Case

Get configuration 21, with a 9.5-inch dual-scan display and 4MB RAM, now for only $2199.

Model N450C-200
Business Lease: $78/Month

intel inside

CALL TODAY.

1800-200-3195

VISA MasterCard DISCOVER

©1994 AMBRA Computer Corporation AMBRA is a trademark of ICPI Ltd. and used under license therefrom.The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation.The Intel Inside and Pentium Processor Logos are registered trademarks of Intel Corporation. All other brands and product names are registered trademarks, trademarks or service marks of their respective holders. Please call for details regarding AMBRA's money-back guarantee, warranty and credit terms. Onsite service may not be available in certain locations. Offerings may differ in Canada. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping. Return shipping and insurance charges are the responsibility of the customer. Lease based on 36 months, offered by IBM Credit Corp. *Upgrade good at time of system purchase. *AMBRA self-tested with 2MB Video DRAM using 1024x768x256 colors. †Title: "Best Item PC Magazine, December 7, 1993." Manuals on CD. Printed manuals can be purchased from Borland and WordPerfect. All manuals on CD. *Borland Office OEM version includes Getting Started Manual. Printed copies of product manuals can be purchased from Borland and WordPerfect.

AMBRA

Ron Kimball Photography

Albany to Anchorage in 26 Seconds

Rand McNally's new *TripMaker*™ software for Windows™ can route you from Albany, New York to Anchorage, Alaska in 26 seconds flat. And to virtually anywhere in the United States, Canada and Mexico. *TripMaker* does more than just plan routes, it plans entire trips. Select your origin and destination and *TripMaker* will get you on your way. Or, *TripMaker* can suggest ideal car trips based on your personal preferences – region of the country, time of year, and more.

TripMaker software includes more than 640,900 miles of roads and 125,000 cities and towns – more than any other software program. Get thousands of point-of-interest ideas with free Attraction Pack™ databases included – and *TripMaker* will route you to your choices.

America's Travel Authority™

TripMaker is based on more than a century of mapping excellence by the most recognized name in travel. *TripMaker* gives you the best map presentation and output available – both on screen and from your printer.

Your Personal Trip Planner in a Box

Trip planning is now easier than ever! Take one of 88 pre-planned scenic tours developed by Rand McNally's travel experts, or experience thousands of fun and interesting attractions included with *TripMaker*. Choose your routing preference and print high-quality maps and driving directions to take with you on the road. You can also cross-reference the itineraries to pages in the *Rand McNally Road Atlas*.

FREE! Over $1000 of travel coupons included

30-day Money-Back Guarantee
ORDER NOW!
1-800-671-5006 Ext. 113
Suggested Retail Price: $79.95
Your Price: $59.95
(plus $7.50 shipping and handling)

System Requirements: Microsoft® Windows™ 3.1 or higher; EGA, VGA, or higher graphics card. DOS 3.3 or higher; 80836 or higher PC recommended. 4 MB RAM or more. Hard drive uses minimum 11 MB; 15 MB maximum for all databases.

Attention users of Automap, KeyMap, Expert Travel Planner, AAA TripPlanner, DeLorme Map 'n Go! Ask about our $29.95 competitive upgrade pricing!

RAND McNALLY

© 1994 Rand McNally. TripMaker, Attraction Pack and America's Travel Authority are Trademarks of Rand McNally. All other product names are Trademarks of their respective holders.

Make it a reality with a ViewSonic monitor. And, since 17" monitors (15.7" viewable diagonal) are the size of choice by most professionals, we offer one for every budget and application. Take pride in knowing the image on your screen is bright, crisp and picture-perfect. Don't settle for less.

In addition to edge-to-edge focus, compatible with resolutions up to 1600 x 1280, and vertical refresh rates as high as 160Hz, our **NEW** ViewSonic 17 and 17G monitors feature OnView. This control system allows you to adjust the image via the on-screen menu, including color matching. Compare specs, price and performance – you'll See The Difference!

During the past year, our monitors have received 16 awards from major computer publications. Plus, ViewSonic was named in *Inc.* magazine's 1992 and 1993 top 500 fastest growing companies. In keeping with our commitment for environmental and energy conservation, these monitors surpass the strict Swedish MPR-II standards for low radiation and support the EPA's Energy Star program.

ViewSonic monitors . . . designed with your image in mind.

PC and MAC compatible.

ViewSonic®

See The Difference!™

Tel: (800) 888-8583 or (909) 869-7976
Fax: (909) 869-7958
Call FaxSonic at (909) 869-7958 (fax-on-demand)
Request Doc. 147 (17E), 148 (17G), 152 (17)
Applelink: VIEWSONIC
Compuserve: 73374, 514

All products and trademarks are brand names of their respective companies.
CAD image courtesy of Engineering Design Automation
3D image courtesy of Spatial Technology, Inc.

Circle 170 on reader service card.

Creativity. It's Your Image.

	ViewSonic 17 17"	ViewSonic 17G 17"	ViewSonic 17E 17"
Screen Size*			
Dot Pitch	0.27mm	0.28mm	0.28mm
Max. Resolution	1600 x 1280	1280 x 1024	1280 x 1024
Max. Refresh	160Hz	160Hz	90Hz
Horiz. Frequency	30-82KHz	30-64KHz	30-64KHz
ViewMatch™ Color Control	Yes	Yes	Yes**
OnView™ Controls	Yes	Yes	No
Flat Square Screen	Yes	Yes	Yes
MSRP	$1,045	$945	$865

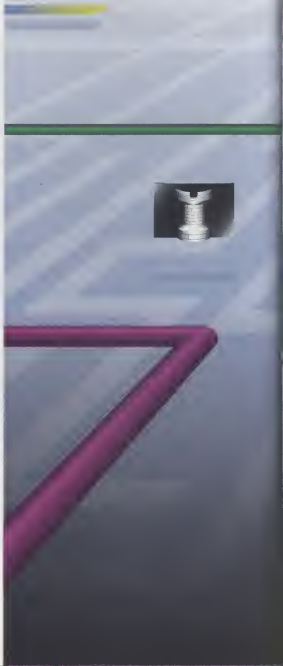
* Diagonal viewable screen areas of 17" monitors from 15.5" to 15.7"
** Color temperature switching from 6500°K to 9300°

Businesses Everywhere Are Taking To the Highway . . .

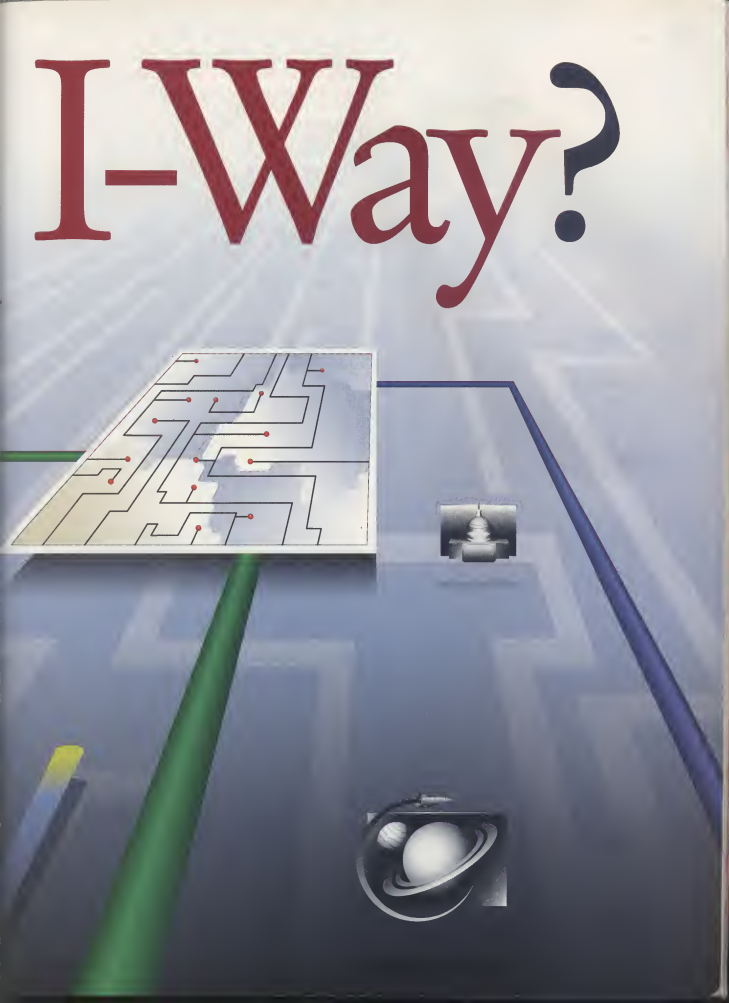
Going

A PRACTICAL USER'S GUIDE

The I-Way is up and running—open for business. It's a secret weapon to help you run your business smarter, be more timely, cut costs, and outdo the competition. The I-Way's power stems from its diversity. But that diversity also makes it daunting at first. Never fear: Coming up are a helpful trio of stories. In "The Net Result" on page 122, you'll learn how to **ACCESS** the Internet, the central artery of the I-Way. "Online Fever" is a **FACE-OFF** comparing commercial online services, starting on page 140. And on page 166, "Dialing for Data" highlights some of the best I-Way **PIT STOPS:** bulletin boards. So let's drive past the hype and onto the real infobahn. Start your engines.



I-Way?



The Net Result

Annual reports from every public company in the country. E-mail addresses for every economist in the free world. Real-time exchange rates. The White House's own searchable archive of every speech Bill Clinton has ever given. Every business title in U.C. Berkeley's library. All this and more is out there right now on the I-Way's fast lane. If you don't get to it first, your competitors will.

With its mother lode of business information poised to give you a competitive advantage, you need to get on the Internet. Well, roll up your sleeves and grab a wrench. It's not easy to connect to the Net, and it's no cinch to get around once you're there, either. Anyone who spends serious time on the Net soon learns that it's a constant challenge—rich and disorganized, sometimes valuable and occasionally hilarious, absolutely unmanaged and unmanageable.

Traditionally, establishing an Internet connection has demanded total immersion in the icy depths of network hardware and software. Protocols and parity settings. IP addresses and domain names. Speeds and feeds. This is far more arcane than anything the average PC-savvy businessperson is likely to have mastered.

It's starting to get easier. But the closest thing to an effortless, completely interactive Internet access package still has a few catches.

To hear some people talk, instant Internet is just around the corner. Your PC will dial a number, negotiate a communications protocol with a remote host, and get its own address. You'll get a log-in name, answer a few simple questions, and voilà, you're on the Net.

Frankly, we'll settle for a full-strength networking package that's relatively easy to install. There are definitely enough options. It seems like every company that sells a Unix connectivity package is working on a scaled-down version for the dial-up Internet access market. Keeping track of each month's new arrivals is like counting snowflakes in a blizzard.

Turn to page 128 for our review of all-in-one Internet access

BY ED BOTT AND TOM LIPKIS

SYNOPSIS

TERMS OF ATTACHMENT: *Your guide to decipbering Netspeak gibberish.* **124**

SURFING SAFARI: *Our favorite Internet destination guides.* **125**

HOW IT WORKS: *Your PC connection.* **126**

NOTHING BUT NET: *Dial-up packages for daily use.* **128**

EASY TCP/IP: *Work faster, save memory.* **128**

NET COSTS: *The Net isn't just another costly online service.* **130**

TOLL ROADS TO THE NET: *Commercial services' Net access.* **132**

FINAL ANALYSIS: *Picks for today and the near future.* **135**

A GOPHER: With navigation-friendly menus, Gopher sites sprang from academia.

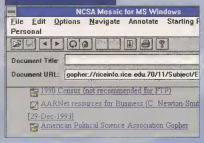
B FTP: Sending and receiving files? FTP sites are a popular exchange for data and programs.

C TELNET: For direct control over eclectic remote resources, Telnet lets you command systems on the Net.

D WORLD WIDE WEB: Hypertext connects related information at global sites with a simple click on a word.

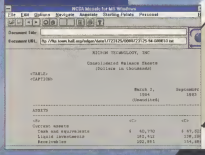
E WAIS: Indexed databases allow speedy searches of government, industry, and other types of data.

A chico.rice.edu



Rice Economics Gopher: Like most academic locations, Rice University organizes data by subject.

B ftp town.hall.org

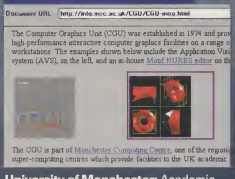


EDGAR: As at other FTP sites, this repository contains government SEC filings for public corporations.

C telnet a2i.rahul.net

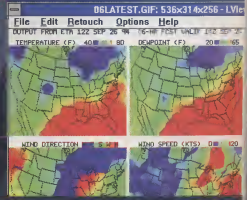
a2i Communications: Once attached to a corporate site via Telnet, you can list files like daily stock quotes.

D http://info.mcc.ac.uk/CGU



University of Manchester: Academic WWW locations build hypertext links to topics such as computer graphics.

E WAIS weather.src



Weather Underground: WAIS simplifies searches for information like a GIF file of the day's weather.

packages. But before we get to the dirty details, let's start with a few fundamental truths.

The Internet rewards serious play. An hour (or six) of determined wandering is worth a hundred magazine articles. The more you explore the Net, the more you're likely to find and the faster you can get around.

The Internet demands good citizenship. There's no single rule book for the Net. But there is a widely accepted code of behavior—*netiquette*—that's built on common sense and easy to discover if you look for it.

Internet access should not be expensive. The actual monthly cost per user for the Internet backbone—the basic communication infrastructure—is about 50 cents. Even after accounting for the provider's phone charges, equipment costs, and overhead, an hour of Internet access per day should not cost you more than a typical cable bill—less than $30 per month.

The Journey Is Not the Reward You want to spend as little time as possible on the highway and as much time as possible at your destination. You want the transportation system to run as smoothly as a Swiss railroad. Above all, you want to find useful stuff.

To help you understand what's out there, here are some places to start looking:

• **Usenet News** You don't have to be a rocket scientist to participate in Usenet news, the Net's collection of discussion groups. But if you are, you'll gravitate to sci.astro.hubble. Shallower inquiring minds will prefer alt.national.enquirer. Newsgroups tend to be more chaotic and less decorous than CompuServe forums.

• **Anonymous FTP and Archie** All sorts of software gems, freeware and shareware, are available using anonymous FTP. A way to send and receive files to servers on the Net, FTP is both a noun and a verb in Netspeak. It's anonymous because anonymous is the user name you type at the log-in prompt of an FTP server. Netiquette suggests you use your e-mail address for the password so you don't remain anonymous. Archie, a utility that searches an index of filenames across anonymous FTP sites, relieves some of the burden of searching FTP servers for a file. If you've ever navigated a DOS directory looking for a file, you'll love the extra information an Archie search provides.

• **Gopher and Veronica** Tunneling through Gopherspace takes you to a menu-based server set up for a specific purpose. For example, the Gopher server at the Electronic Frontier Foundation (gopher.eff.org) contains a collection of data about electronic personal privacy. Every Gopher server has pointers to other Gopher servers. Gopher servers have a search capability similar to FTP's Archie called Veronica, which scans through titles on every Gopher server it knows of to find requested information.

• **Wide Area Information Servers** Instant answers—that's the promise of WAIS, originally developed by Thinking Machines. Unlike Gopher collections, which are indexed only by menu title, every document in a WAIS database is fully indexed. If a graphic description or a text document contains the word amnesia, you can find it in a WAIS search.

Although the government and private sector have begun to index databases for the WAIS system, it has achieved only a fraction of its potential, probably because maintaining a WAIS database is a supreme

KEY WORDS NOT ENOUGH TECHNOBABBLE? THE **INTERNET** ADDS ITS OWN JARGON

Terms of Attachment

Domain Name System: A distributed database that translates computer names (like pcc.ziff.com) into numeric IP addresses, and vice versa.

FAQ: A list of frequently asked questions helps newcomers to a Usenet newsgroup get answers to common questions, reducing repetitive postings.

FTP: File transfer protocol is a utility (and corresponding protocol) to move a file across the Net from one system to another.

HTML: The Hypertext Markup Language is used to tie different data types into a World Wide Web document.

IP Address: In the Domain Name System, the 32-bit number that identifies a location on the Internet. It is usually broken into four groups, such as 123.123.1.123.

MIME: The Multipurpose Internet Mail Extensions is a standard for encoding multiple data types—text, movies, sound, etc.—in a mail message.

Packet: This is the basic unit of information on the Internet. Each transmission is broken into packets, which travel independently around the network.

PPP: Point-to-Point Protocol is one of two popular protocols for exchanging Internet packets over a dial-up phone line. More flexible and robust than SLIP.

RTFM: Loosely, "Read the *furshlugginer* manual."

SLIP: Serial Line Internet Protocol is the other popular protocol for connecting a computer to the Internet over a dial-up phone line.

TCP/IP: Transmission Control Protocol/Internet Protocol are two basic building blocks of the Internet. TCP is a connection-oriented protocol; IP is a lower-level packet-handling protocol. Together they make sure data gets from one point to another on the Net.

Telnet: This is both a protocol and the generic name for a utility that allows a person to log in to a remote computer.

technical challenge. One prosaic but universally useful WAIS database is zipcodes.src, a database of zip codes in the United States. (Use Telnet to connect to quake.think.com and use its WAIS client for the search.)

• **World Wide Web** Encompassing many tools and utilities found elsewhere on the Net, the Web is a distributed hypermedia system. By following the links in a document, you can hopscotch to related information—not just in that file but anywhere on the Web, even if it's halfway around the world. Web documents often include graphics; some contain embedded links to other media types as well—such as PostScript or GIF graphics, sound samples, MPEG or QuickTime movies. To handle these, you'll need a graphical browser, like the National Center for Supercomputing Applications' Mosaic, plus applets to play back sound and video or display graphics. You'll also need patience. Downloading multimedia over a dial-up connection takes time.

• **Internet Mail** Finally, you can communicate via Internet mail with just about anyone, thanks to Net gateways to virtually every public e-mail system.

Given the richness of the Net, it's no wonder there's a stampede to get access. But with dozens of ways to connect to the Internet, the question is: How?

You Can Get There from Here If your corporate network has a direct connection to the Net, and you're on good terms with the net administrator, you're set. If not, skip some setup headaches by using an online service's access (see "Toll Roads to the Net," page 132).

But for the most flexible graphical access to the Internet outside the office, your best bet is a full Serial Line Internet Protocol/Point to Point Protocol (SLIP/PPP) connection (see "SLIP/PPP: Direct IP Benefits without Unix Hassles," page 126). To get there, you'll go through the following four-step process:

• **Step 1** Establish an account with an access provider. You'll be given a phone number(s), log-in name, password, and the technical information you'll need to configure the access software, such as an IP address, domain name, and assorted technotrivia. (For pointers to local access providers, see "Surfing Safari," at right.)

• **Step 2** Back up everything so you can get back to ground zero. You're about to rearrange DOS, Windows, and maybe even some hardware. At a bare minimum, back up AUTOEXEC.BAT, CONFIG.SYS, and your Windows and System directories.

• **Step 3** Add network and communication drivers to your PC. This usually means installing a TCP/IP stack and configuring it to dial in to your access service.

• **Step 4** Configure the Internet utilities. You'll need to provide the names of preferred mail and news servers to your mail and news clients.

Repeat steps 1 through 4 as necessary until everything works. Our advice: Set aside half a day for setup and troubleshooting.

TOM LIPKIS *has been using the Net for research and business since 1972.*

BOOKSHELF INTERNET **YELLOW PAGES**

Surfing Safari

One reason corporate Charlie doesn't surf the Internet is the sheer volume of information. Short of spending some time on a friend's connection, a book is the best way to learn about the Internet and its resources.

Go to an average Barnes & Noble bookstore today and there's a separate wing dedicated to the Internet. A comprehensive list of current titles is available in the Usenet newsgroup alt.internet.services and via anonymous FTP at rtfm.mit.edu:/pub/usenet/news.answers/internet-services/internet-booklist.

To sift out the chaff, we asked our staff for their favorite titles. These books will teach you how to wax your data surfboard and cut back against the rising wave of Internet data.

Zen and the Art of the Internet: A Beginner's Guide
by Brendan P. Kehoe (Prentice Hall)
As a newcomer to the Net, I looked for a low-cal book to guide me through the maze as painlessly as possible. Kehoe's style is light, engaging, and just right for Net freshmen. When I grow up, I'll check out *The Whole Internet.*—*Yael Li-Ron, Help Editor*

The Internet Resource
by Quick Reference Corp. (Que Publishing)
I don't need a monstrous Internet tome sitting next to my computer. I need a pocket-sized, Michelin-style guide. *The Internet Resource* fits the bill. Its alphabetic listing of Usenet newsgroups provides quick one-sentence descriptions that keep you from wasting time.—*Matthew J. Lake, Senior Editor*

The Whole Internet
by Ed Krol (O'Reilly & Associates)
I'm surprised there aren't Bible study groups around this book. *Everybody* seems to treat it as a definitive work. No wonder. It has everything from explanations of networking concepts to descriptions of connectivity options to a listing of key Internet destinations and service providers.—*Chris Sandlund, Associate Editor*

The Internet Directory
by Eric Braun (Fawcett Columbine)
As an editor, I demand *accuracy.* That's why I appreciate Eric Braun's efforts to verify each Internet address—from newsgroups to FTP sites to Gopher databases. Not to mention his exhaustive index. Braun's detailed descriptions of Net sites give me the information I need to decide where to troll for data.—*Richard Schwerin, Associate Editor*

Untangling the Net

What does it take to make a powerful, usable, completely interactive Internet connection, minus the usual hassle? What does a remote office or individual user really need to dial up the Net?

For starters, you need the network plumbing: a TCP/IP stack that hooks into Windows, plus software to connect your PC with a remote host. You also need usable utilities to tap Internet resources without issuing complex commands. And if the software developers are doing their jobs, you should get a fill-in-the-blanks installation routine and concise documentation.

We selected four shrink-wrapped products that fit our criteria. Each includes everything you need to make a dial-up connection, usually via Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP). (See below for more details.) At a minimum, each package includes simple FTP and Telnet utilities, a news reader, and a mail client. Prices vary, but we still prefer to pay less than $200.

We also looked at The Pipeline, a unique Net access package that tries to organize the Internet and provide low-cost access without requiring TCP/IP.

Finally, we harvested an assortment of free (or nearly free) Internet access utilities directly from the Net to see whether they can compete with their commercial cousins in terms of power and usability.

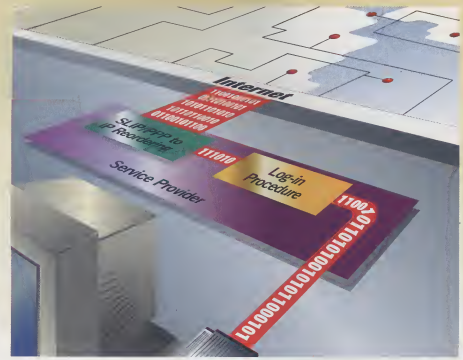
Our conclusions? It takes a thorough reading of the documentation to get most of these packages running. Installing and configuring the software was often needlessly complicated, but not impossible.

Many of the packages we examined were raw and rough-edged. Don't let the shrink-wrap fool you. With the exception of The Pipeline, a healthy dose of usability testing would do wonders for most of the interfaces.

HOW IT WORKS

SLIP/PPP: DIRECT IP BENEFITS WITHOUT UNIX HASSLES

Previously, connecting PCs to the Net meant adding a Unix gateway and a leased 56Kbps phone line to your LAN. Your company balks at the cost? Volunteer to become a Net guinea pig with a Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP) dial-up connection. It costs less and shields you from Unix.



Preparing Packets: Your PC organizes your data into packets in the IP format, dials up the service provider via a high-speed modem, and sends the packets serially.

Service Provider: A Unix software routine recognizes the incoming signal and initiates the log-in process. Once the name and password are approved, the service provider's host changes over to SLIP or PPP mode and reorders serial packets into network-ready IP packets. The host then forwards the packets through its network connection to the Internet.

EXPLORE the INTERNET!

FREE

DELPHI is the only major online service to offer you full access to the Internet. And now you can explore this incredible resource with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use DELPHI's Internet mail gateway to exchange messages with over 20 million people at universities, companies, and other online services such as CompuServe and MCI Mail. Download programs and files using **FTP** or connect in real-time to other networks using **Telnet.** You can also meet people on the Internet. **Internet Relay Chat** lets you "talk" with people all over the world and **Usenet News** is the world's largest bulletin board with over 4500 topics!

To help you find the information you want, you'll have access to powerful search utilities such as "Gopher," "Hytelnet" and "WAIS." If you aren't familiar with these terms, don't worry; DELPHI has hundreds of expert online assistants and a large collection of help files, books, programs, and other resources to help get you started.

Over 600 local access numbers are available across the country. Explore DELPHI and the Internet today. You'll be amazed by what you discover.

FIVE HOUR FREE TRIAL!

Dial By Modem 1-800-365-4636, Press return until you get a prompt At Username, enter JOINDELPHI. At Password, Enter PCC949

Offer applies for new members only. A valid credit card is required for immediate access. Other restrictions apply. Complete details are provided during the toll-free registration.

Attention Current Internet Users: See what DELPHI can offer you! Stock quotes, Grolier's Encyclopedia, newswires, and hundreds of other services are just a few keystrokes away. Telnet to delphi.com and enter the username and password above for a free trial.

Circle 239 on reader service card.

DELPHI
INTERNET

Questions? Call 1-800-695-4005.
Send e-mail to INFO@delphi.com

Nothing but **Net**

You have an account with an Internet access provider. Now you need software. Take a deep breath. Relax. Adding TCP/IP to your PC won't be *that* bad.

A quick note: We tested each of these products using Windows for Workgroups 3.11, but they'll work equally well under Windows 3.1.

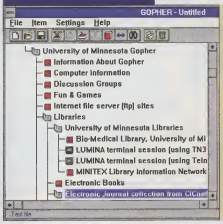
NetManage's Internet Chameleon According to the box, installing this scaled-down version of the $499 Chameleon 4.0 package should take 5 minutes. We took about an hour. After clicking through the last dialog box, we were smoothly running the NetManage Enhanced Windows TCP/IP (NEWT) stack and Chameleon's eight Internet utilities.

If you get Internet access from a major provider, scripts to automate the configuration process are prebuilt. On the other hand, setting up a PPP connection for a new provider can be overly complicated.

NEWTnews, Chameleon's News Reader, forces you to work with a single list of articles. Sorting by subject line helps organize articles but is a poor substitute for a true, threaded news reader.

Thanks to support for Multipurpose Internet Mail Extensions (MIME), the mail client can send and receive multimedia attachments. It can filter incoming mail using rules and user-defined folders and handle binary attachments. You can also hide address headers and build address book entries from incoming messages.

Internet Chameleon



Golden Gopher: The Gopher client's view clearly positions you in the menu structure. The utility shows how NetManage integrates ease of use in its Chameleon product.

The tree-oriented Gopher client works well (although we couldn't automatically view files using anything except Notepad). The FTP client is a mess as far as usability goes, with a slew of unintuitive buttons and nonstandard controls. With the single exception of the FTP client, this is a solid package that really provides everything you need at a reasonable price.

Internet Chameleon / NetManage / (408) 973-7171 / sales@netmanage.com / $199 / *Reader Service No. 650*

PIPELINES SMALL, FAST, EASY **TCP/IP**

TSR, DLL, or VxD?

For now, vendors implement the Internet TCP/IP stack in one of three ways: terminate-and-stay-resident programs (TSRs), Windows DLLs, or Windows virtual device drivers (VxDs). Which has the brightest future?

The Wollongong Group's Pathway Access is the only TSR-based package we examined. DOS TSRs consume precious memory below the 1,024K line and are relatively slow. They work best when accessing internetworked resources from a DOS prompt.

DLLs are essentially Windows executable files that use no DOS memory. Some corporate developers like DLL-based products such as **NetManage's** Internet Chameleon because it's easy to hook them in with new programs. They're also compatible with older PCs that can run Windows 3.1 only in standard mode.

In performance terms, however, **Frontier Technologies'** VxD-based TCP/IP stack, SuperTCP for Windows, can't be beat. It runs in 32-bit protected mode and communicates directly with hardware. VxDs are fast and allow Windows to keep network requests flowing. The only disadvantage: If you have a RAM-hungry DOS program, you may not have enough memory to start it up from a DOS box within Windows 3.1.

By next year, Windows' new version will settle the debate with its own VxD-based TCP/IP component.

Frontier Technologies' SuperTCP for Windows Frontier Technologies gave us more than we bargained for: a full-featured networking product that's at home in big PC-Unix environments (and priced to match). Fortunately, the straightforward instructions walked us deliberately through the installation.

We had no trouble installing the TCP/IP stack, and the detailed online help made it easy to configure the PPP connection. Our main criticisms: sketchy documentation and too many nested dialog boxes.

SuperTCP's bundled Internet utilities range from serviceable to slick. The FTP utility is busy but not hard to figure out. The mail client goes beyond simple e-mail, supporting the MIME standard and processing messages through the use of simple rules.

On the downside, there's no Gopher client, and the rudimentary news reader is both ugly and limited

What's the "E" Stand For??

everyone

Now anybody can use e-mail like a professional. Even professionals.

Easy

Forget cryptic routing instrutions, user IDs, and everything else. E-Mail Connection does all the work.

everywhere

At home, at work or away. From one on-line service to another. In a network or between them.

EFFECTIVE

Now there's one easy-to-use e-mail package that lets you communicate through scores of on-line services, electronic postal delivery and fax.

E-Mail Connection is your single window to: CompuServe®, Prodigy®, MCI-Mail®, cc:Mail®, Lotus Notes®, MS Mail® and Netware® MHS Systems.

Easily send, reply or forward any message—even attach files. E-Mail Connection's single interface makes e-mail management simple.

It's so convenient it automatically signs-on to retrieve and send messages, whenever you want—hourly, daily or weekly. There's no need to jump between services to check your mail.

The E-Mail Connection Address Book even logs and files the names and e-mail addresses of the people with whom you communicate, automatically.

On the road, E-Mail Connection's Global Phonebook gives you online service access numbers for hundreds of cities worldwide.

See for yourself why E-Mail Connection is "Your best connection to the world of electronic messaging, including fax and postal delivery."™

Enthusiasm

"E-Mail Connection offers so many benefits that I've made it my standard e-mail program."
Windows Magazine, Dec 93

"E-Mail Connection does the seemingly impossible: it makes electronic mail easy to use."
Computer Shopper, Dec 93

"No other e-mail package comes close to the functionality and flexibility of E-Mail Connection 2.0."
PC/Computing, July 94

"...gets the job done better than any other commercial mail package I've seen."
Wall Street Journal, Aug 93

"E-Mail Connection is the default champion of e-mail collectors."
PC Magazine, Oct 93

"We like the flexibility and routing capabilities E-Mail Connection offers."
Infoworld, June 94

EXCITING OFFER!

NOW ONLY $49.95
Reg. $99.95

1994 WIN AWARD 100 WINDOWS MAGAZINE

MICROSOFT WINDOWS COMPATIBLE

ConnectSoft

Call Today
1-800-234-9497
Hurry! Quantities are limited!

Available at Egghead Software, Electronics Boutique or your local retailer.

ConnectSoft • 11130 N.E. 33rd Place, Suite 250 • Bellevue, WA 98004 • FAX: (206) 822-9095

Brand, product and service names are used for identification purposes only and may be trademarks or registered marks of their respective holders.

Circle 210 on reader service card.

in strength. For example, it doesn't allow you to sort messages in any way.

By late summer, Frontier plans to release SuperHighway Access, a $149 dial-up–only version. The stripped-down package drops high-end features such as servers (mail and FTP), but adds Gopher and Archie clients, plus a Web browser that's reportedly more advanced than Mosaic.

SuperTCP for Windows / Frontier Technologies / (414) 241-4555 / tcp@frontiertech.com / $395 / *Reader Service No. 651*

Spry's Air Series We wanted to review Spry's Internet In a Box, but what we got was more along the lines of Internet In a Bunch of Boxes.

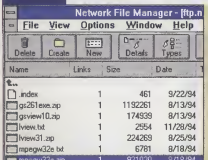
Last December, network specialist Spry announced plans to team with O'Reilly & Associates (publishers of Ed Krol's classic book *The Whole Internet*) on a joint venture called Internet In a Box. Spry's $299 Air collection contains the TCP/IP stack and Internet utilities that are scheduled to be part of the final package. (A copy of the Mosaic World Wide Web reader, the Krol book, and an optional access account will also be in the box.) We looked at a beta release of the Spry-O'Reilly bundle that did not include the final installation routine, so we couldn't evaluate whether Internet In a Box will live up to its name.

With one exception, Spry's Internet applications were less than impressive. Air News looks pretty but can't filter out message headers or follow threads in a newsgroup. The Air Mail client doesn't support MIME, and sending or receiving binary files is a clumsy two-step process. There's also a basic Gopher client.

The star of the suite is the Network File Manager, an FTP client that closely resembles the Windows File Manager. When you launch the program, it even arranges itself alongside a File Manager window to let you drag and drop files in either direction.

Spry's common interface is handsome, with readable WordPerfect-style icons and a Windows NT–style cursor—a combined arrow and hourglass—to give you visual feedback indicating that you can do other tasks while it works in the background.

Air 2.0



FTP à la File Manager: Simply drag remote files to your local PC. The Network File Manager is the star of Spry's forthcoming Internet utility product suite.

PIPELINES HOW BILLING WORKS

Net Costs

Money makes the world go round, but you'd never know that by looking at the growth of the Internet. In its current state, the Internet is a social phenomenon, a cooperative community designed to help researchers work together and give ordinary citizens direct access to the raw materials of knowledge. Best of all, it's essentially free.

That's about to change. Those who helped the Net become unimaginably large are horrified at the thought of paying for Internet services. (Check out Penn Jillette's August column, "Tolls for Thee?" page 320.) Even those who accept the notion of reasonable fees are concerned that the Internet could change from a low-cost populist experiment into a premium-priced capitalist tool. Restrictions on commercial activity are essentially gone, which has opened the door for CommerceNet and other profit-minded organizations to create mechanisms to track commercial transactions on the Net. And it has touched off a passionate debate.

The central question is: Who pays to ship the bits around? Uncle Sam is less likely to continue paying for a commercially oriented backbone.

It shouldn't be that expensive. According to one estimate, the entire cost of the U.S. portion of the Internet backbone is 50 cents per user, per month. As long as people continue to use the Net at current levels, that cost won't go up no matter how many new users connect. The trouble is, usage isn't remaining constant—it's increasing fast.

Charging for each packet sent isn't the answer. In that scenario, some useful services—such as FTP sites and list-based discussion groups—would simply disappear. And a flat fee doesn't provide any incentive for users to treat Net bandwidth as a scarce resource.

The most sensible proposal we've seen was floated by two economists at the University of Michigan. Their plan would prioritize packet transmissions based on an automated form of competitive bidding. Under their scheme, you could pay a premium to assign a high priority to packets, or you could choose reduced performance for a reduced bill. The proceeds would be used to create additional capacity on the Internet.

No matter how the fee issue is settled, it's obvious that dollars and deutsche marks will soon be zipping alongside bits and bytes on the Internet. The best of all possible worlds is an Internet with enough room for everyone—especially in the free and dirt-cheap zones that make it such a rich resource to so many different people. ED BOTT

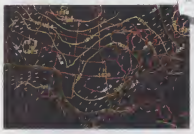
Use The Internet Like A Pro.

Navigating the Internet Just Got Easier with WinGopher

Have you wanted access to the Internet without the hassle of typing complicated addresses or memorizing file locations? Do you lose valuable time wandering through a maze of servers and unwanted files? Now you can organize and simplify your Internet access with WinGopher™, a Microsoft® Windows™-based Gopher client.

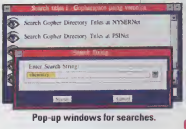
MICROSOFT WINDOWS COMPATIBLE

Requirements for Gopher Clients	WinGopher
Complete Package for Immediate Access	✓
Installation Support	✓
Users' Guide and Online Help	✓
Includes Text & Image Viewers & Telnet	✓
Supports Windows Sound and Video Viewers	✓
Supports Phone Books	✓
Enhanced Bookmarks	✓
Views Multiple Open Servers	✓
Supports Winsock Compatible TCP/IP Stacks	✓
Compatible with Other Windows Applications	✓



View multiple servers at one time.

WinGopher provides you with a graphical interface that uses pull-down menus and point-and-click functionality for easy Internet navigation. Using the Gopher protocol, WinGopher supports Archie, Veronica, and WAIS searching. FTP transactions and Telnet sessions are supported, as well as any Windows sound or video viewer. An image viewer and text viewer are included with WinGopher.



Pop-up windows for searches.

Why WinGopher?

WinGopher is a fully supported product, including installation phone support, user documentation, online help, and a bulletin board service. Backed by a leading automation firm, you're not left stranded should you need assistance.

WinGopher Solutions to Meet Your Needs

Whether you need a complete package to begin accessing the Internet, or you are already connecting to the Internet, WinGopher offers you the solution to meet your needs.

WinGopher provides you with a graphical interface to the Internet. It requires: Windows TCP/IP stack software (Winsock 1.1 compatible) and connection; 386 PC or higher with Windows 3.1 and DOS 5.0; 3.5 MB disk space and 2 MB more memory. **$69.95**

Now Available – WinGopher Complete provides you with everything you need to start accessing the Internet immediately. Included are WinGopher, a Windows TCP/IP stack software package (Winsock compatible), and an Internet connection through a leading national access provider. With WinGopher Complete, you get 30 free minutes of Internet connect time from a participating access provider. **$129.00**

Call 1-800-55-NOTIS

FAX: (708) 866-4970 • **email:** wingopher@notis.com

WinGopher™

GRAPHICAL INTERFACE FOR THE INTERNET

NOTIS Systems, Inc. • An Ameritech Company • Evanston, IL 60201-3622

Circle 195 on reader service card.

Internet On-Ramps: The Best Dial-Up Solutions

If all Air utilities rise to Network File Manager's level, and Spry delivers a silky-smooth installation, Internet In a Box will be well worth the wait.

Air 2.0 / Spry / (206) 447-0300 / info@spry.com / $299 / *Reader Service No. 652*
Internet In a Box / Spry-O'Reilly & Associates / (800) 998-4269 / ibox@ora.com / $149 / *Reader Service No. 653*

Wollongong Group's PathWay Runtime 2.0/ PathWay Access 3.0 The PathWay line is worth evaluating if you're setting up a mixed PC-Unix network. But it's overkill for anyone who simply wants to establish a dial-up Internet connection.

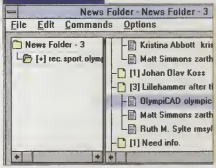
The Internet access applications are consistently underpowered and ungraceful. The combined mail and news reader is a good idea but, like all of the PathWay apps, suffers from a clumsy interface with blocky system fonts. The exception is a useful graphical keyboard remapper. For dial-up Internet access, look elsewhere.

PathWay Runtime 2.0, **PathWay Access 3.0**/ The Wollongong Group / (415) 962-7100 / $195 (DOS and Windows versions); $350 / *Reader Service No. 654*

The Pipeline Part application, part New York-based access service, The Pipeline provides its own thoughtful organization of the Internet. Its menus, which are mostly in plain English, actually make sense of the Net. The Pipeline's long-term mission is to license its software for use with other dedicated access providers to reduce long-distance phone charges.

Built-in applications include a Gopher client, fill-in-the-blanks FTP client, and a tree-and-viewer news reader that handles newsgroups with aplomb. It's all tied together with a proprietary, performance-tuned packet-transfer protocol. Overall, tasks seemed to execute faster than they did on a SLIP connection. The downside is its lack of support for a Web browser,

The Pipeline



Direct Approach: The Pipeline's threaded news reader excels. The program also manages requests in the background to speed response.

PIPELINES WHEN FACED WITH THE INTERNET, WHAT'S AN **ONLINE SERVICE** TO DO?

Toll Roads to the Net

Online services such as Delphi, CompuServe, and America Online are generally highly managed with centralized member directories, restrictions on message content in public forums, and a relentlessly ticking meter. Those attributes are completely at odds with the decentralized, virtually uncensored, usually free nature of the Internet. So how are the major online services dealing with their members' clamor for Internet access?

Instead of giving its members access to the Internet, CompuServe allows Internet users to Telnet to the online giant. When you connect from the Net, CompuServe asks you to select a speed (up to 9,600 bps), then throttles performance back to that level, no matter how fast your Internet connection.

The only other Internet service currently available is an e-mail gateway. There is an active Internet forum on CompuServe called GO INETFORUM, which provides up-to-date news and a place to talk about Net issues in CompuServe's more structured environment.

America Online also offers an Internet e-mail gateway. To go beyond mere messaging, you head for the Internet Center, a pretty but irritatingly slow icon- and list-based front end to newsgroups, mailing lists, Gopher servers, and WAIS databases. As of press time, America Online still had not delivered its promised FTP and Telnet utilities. At $3.50 per hour, almost twice what typical Internet access providers charge, it's an outrageously expensive way to access the Internet. Anyone who wants America Online's style of hand-holding will be far better off with The Pipeline (see above). It's more powerful and easier to use—and costs much less.

To get a sense of where Delphi is heading, just look at its full name—Delphi Internet Services Corp. Delphi, a corporate cousin of Bix, the Byte Information Exchange, is an online graybeard trying to turn the Internet into a fountain of youth. With its menu-based interface and organization by forums, Delphi resembles CompuServe. The difference? Individual section organizers blend Internet resources with their own material. A menu choice may pull a file from a distant FTP server or Telnet over to a weather server. You can also access the Internet directly via a command line. The online rates ($13 per month, plus connect-time fees) are low, but Delphi doesn't add enough to satisfy serious Net users. ED BOTT

Philips Shatters The Status Quo In Monitor Technology.

(Lift to see how it all comes together, perfectly)

LIFT HERE

PHILIPS

LIFT HERE

Philips Brilliance™ 21A Monitor with new CyberScreen® technology dramatically reduces beam misconvergence and increases color and brightness uniformity to give you the best on-screen image you've ever seen.

For more information, call toll-free

1-800-835-3506

BRILLIANCE™

HIGH RESOLUTION MONITORS

Another First From Philips

PHILIPS

Introducing Philips Brilliance™ 21A With CyberScreen®

- *Brightness uniformity over the screen of 90% or more. For traditional monitors, uniformity is only 75% or less.*
- *Superb color uniformity and accuracy. (x and y coordinates change no more than +/- 0.006 over the screen, as compared with +/- 0.015 for traditional monitors.)*
- *Exclusive Magnetometer maintains constant magnetic field so there is no sensitivity to north, south, east or west orientation.*
- *Maximum misconvergence of 0.2 mm. (traditional technology is .35 mm.)*
- *High resolution up to 1600 x 1280.*
- *High refresh rates up to 76 Hz in 1280 x 1024 mode*.*
- *Large flat square screen with fine 0.28 dot pitch.*
- *Black Matrix Invar tube.*
- *Autoscan with high 30-82 kHz scanning rates and 150 MHz video amplifier bandwidth.*
- *Low-emissions comply with MPR-II and ISO-9241 standards.*

BRILLIANCE™
HIGH RESOLUTION MONITORS

Call 1-800-835-3506
In Canada, 1-800-387-0564

CMP CHANNEL ADVOCATE

BEST OF BYTE COMPUTER (Fall '93) Finalist

Another First From Philips

PHILIPS

PHILIPS

* Actual refresh rates may vary by video controller and/or software
CyberScreen Technology is a registered trademark of Philips Electronics, N.V.
© 1993 Philips Consumer Electronics Company, A Division of North American Philips Corporation

Internet On-Ramps: The Best Dial-Up Solutions

although that feature is due to be in the next upgrade.

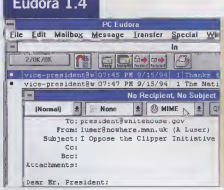
Basic Pipeline accounts cost about what most access providers charge. The software itself is free. If the toll charges aren't a stumbling block, The Pipeline is a fascinating option worth checking out.

The Pipeline / The Pipeline / (212) 267-3636 / info@pipeline.com / Free / *Reader Service No. 655*

The Internet for Less We also found a nearly complete suite of free and shareware tools that were a match for anything in shrink-wrap. (The free Mosaic World Wide Web reader is also a must.) All of the products mentioned below can be found in pub/pc/win3/winsock at ftp.cica.indiana.edu. We've included filenames that were accurate at press time. We also posted them on PC Contact as NETUTL.ZIP in data library 3 (Utilities/Misc.). (See page 250 for information on accessing PC Contact.)

- **Trumpet Winsock** (WINSOC.ZIP) is a $20 shareware package that includes a TCP/IP stack, command-line FTP utility, and basic Telnet package. It turned out to be one of our easier SLIP installations. However, Trumpet Winsock also offers a news reader that's hard to recommend.
- **HGopher** (HGPH24.ZIP) is a free Windows Gopher client good enough to be a commercial product. Best of all, it supports the new Gopher+ protocol, unlike other Gopher clients we saw.
- **WinVN** (WNVN082S.ZIP) is a news reader that sorts messages by threads. For serious news users, it's a must—and it's free.
- **Eudora 1.4** is the freely distributed version of QualComm's popular mail client. It supports MIME and sports an interface complete with icons and folders. To get it, anonymous FTP to qualcomm.com.

Eudora 1.4



No Postage Due: MIME support, shown here, allows mail messages to include multimedia files. Better yet, it won't cost you a dime.

Final Analysis: Today Chameleon or Pipeline . . . but Tomorrow?

1. For a full TCP/IP connection to the Internet today, Internet Chameleon wins our vote.
2. The Pipeline gives immediate Net gratification without networking headaches.
3. If you can wait for the next version of Windows, life will get much less complicated.

If you need to get on the Internet today, you won't go wrong picking up NetManage's Internet Chameleon for your Windows interface. Its installation routine outshines most we slogged through. At $199, it won't leave you scrounging for extra pennies to pay your service provider.

Take a look at The Pipeline if you live in an area with local access. If other service providers agree to use its friendly, powerful software, The Pipeline could become the hottest spot on the Internet.

Dead Parrot's Society By this time next year, most third-party TCP/IP drivers will be like the parrot in the classic Monty Python sketch: Defunct. Extinct. Moribund. In a word, dead. When the next version of Windows, code-named Chicago, arrives a few months from now, its built-in TCP/IP support will be a killer feature, literally. Designed to make Chicago a respectable citizen on big networks, TCP/IP support also gives users everything they need for a fast and easy dial-up connection to the Net.

Chicago supplies a set of standard services that will make third-party Internet utilities more interesting than anything you can use today. Its lowest network levels include a 32-bit protected-mode version of the TCP/IP stack and Windows Sockets programming interface. The combination should be compatible with virtually all Internet utilities. TCP/IP installation should be orders of magnitude easier.

Outside Support Right out of the box, you'll also get Remote Access Service (RAS)—a single-line, dial-up server that supports Point-to-Point Protocol (PPP) and password-protected user accounts with basic security. Start with a plain-vanilla PC connected to the Internet via a corporate network, add Chicago's RAS, and you're all set up to access the Net.

There should be an explosion of Net-specific Chicago add-ins and utilities. For newsgroup and hypermedia applications, Chicago's multithreading should provide a big boost in performance and productivity. Windows' Messaging Application Programming Interface (MAPI) should also pay off in more flexible mail clients that simultaneously handle Internet mail, faxes, corporate e-mail, and traffic from outside services like CompuServe. One thing's for sure, Chicago will raise the bar. We'll expect to see higher levels of software athleticism the next time we look at Net packages.

The Contura Aero

7.5 x 10.25 x 1.5 Inches[1]

Powerful 486 Processor

Backlit VGA Screen

Up To 6-Hr. Optional Battery

Instant-On Feature

Optional Docking Base

About 3.5 Pounds[1]

Optional PCMCIA Floppy Drive

Free 3-Year Warranty[2]

Monochrome From $1,399[3]

COMPAQ

©1994 Compaq Computer Corporation. All rights reserved. Compaq, Contura Registered U.S. Patent and Trademark office. Aero is a trademark of Compaq Comp
For information via fax on our limited warranty, consult the Compaq Customer Support Center at 1-800-345-3518, select the PaqFax option and request document number

operation. ²Size and weight indicated are for the Contura Aero 4/25 Model 184 and Model 170. Model 4/33C pictured here: weighs 4.2 lbs. ³Batteries and certain options covered by a one-year warranty. Certain restrictions and exclusions may apply. ⁴For product information, select document number 4000. ⁵Estimated reseller price. Prices will vary. Model 4/33C pictured here starting at $2,199. The Intel Inside logo is a registered trademark of the Intel Corporation.

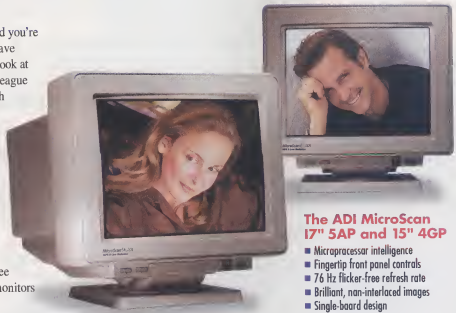
Circle 185 on reader service card.

Sony With Soul

ADI.

ADI delivers the reliability and quality of Sony, without the brand name price.

You want a top-of-the-line monitor. And you're looking at Sony MultiScans. But you have bottom line concerns, and you'd like to look at a cost-efficient alternative in the same league as Sony. Look at ADI MicroScan.™ With microprocessor intelligence. 18-mode memory. Front panel digital controls. 76 Hz non-interlaced scanning for stunning, flicker-free images. Razor sharp resolution of up to 1280 x 1024. Special anti-glare, dark glass CRT surfaces. And performance that meets or exceeds every standard for manufacturing, power conservation, ergonomics and safety. That's why three million ADI MicroScan monitors have been sold.



PC MAGAZINE EDITORS' CHOICE
March 16, 1993
ADI MicroScan 3E+

Then to sum up the differences, between Sony and ADI, look at the price tags. With ADI, the sum you save will let you go out and buy a top quality TV set for your living room. Say a Sony.

For information on ADI, our monitors and our company, call (800) 228-0530 today. For faxed product information and editorial reviews, call (800) 767-8182

The ADI MicroScan 17" 5AP and 15" 4GP

- Microprocessor intelligence
- Fingertip front panel controls
- 76 Hz flicker-free refresh rate
- Brilliant, non-interlaced images
- Single-board design
- 2-year warranty

ADI

Any way you look at it.

ADI Systems, Inc. 2115 Ringwood Avenue, San Jose, CA 95131

MicroScan is a trademark of ADI Systems Inc. All other brands or product names are trademarks or registered trademarks of their respective companies
© 1994 ADI Systems Inc. All rights reserved

Circle 173 on reader service card.

Online Fever

SYNOPSIS

PLEASE, MR. POSTMAN: *Who's great for e-mail bonding?* **142**

BEAM ME DOWN: *How to download infobahn souvenirs.* **143**

KEEPING UP-TO-DATE: *Get the news before the paper arrives.* **144**

INCREASE YOUR NET WORTH: *The route to the Internet.* **145**

MORE BANG FOR YOUR BITS: *Offline work keeps bills in line.* **146**

USABILITY WINNER: *Our testers' pick.* **148**

E-MAIL TRAVELS: *Get mail to other services.* **154**

BEST WAY TO GO: *Which service meets your needs?* **163**

You know where you want to go, but the Internet's awesome diversity has you feeling like a doormat on the floor of Grand Central Station. Your business needs are simple—send e-mail, get the latest stock and news information. Sometimes the fastest way to get the information you need is to veer off the main thoroughfare and shop the surface streets—online services.

The three major online services—America Online, CompuServe, and Prodigy—can often be the fastest ways to get answers to your business questions. All three are either Windows-based or have Windows front ends designed to make navigating to the data you need easier. They've all recognized that merely offering megadata doesn't cut it any more. Folks need an easy way to get at that information—and fast.

To find out if the online services have turned the corner in putting information at hand, we delved into all three services online. Then we brought computer users—people just like you—into our Usability Labs and conducted tests with them at the wheel.

We found that the online world has come a long way since the days of text-based interfaces and obscure navigational commands. Now when you want to read a news story or get stock quotes, you can click on an easy-to-understand icon. That's not to say that the road signs are always well-lit on this particular stretch of the information highway. We found that even a task that should be simple—sending e-mail—can be surprisingly difficult at times.

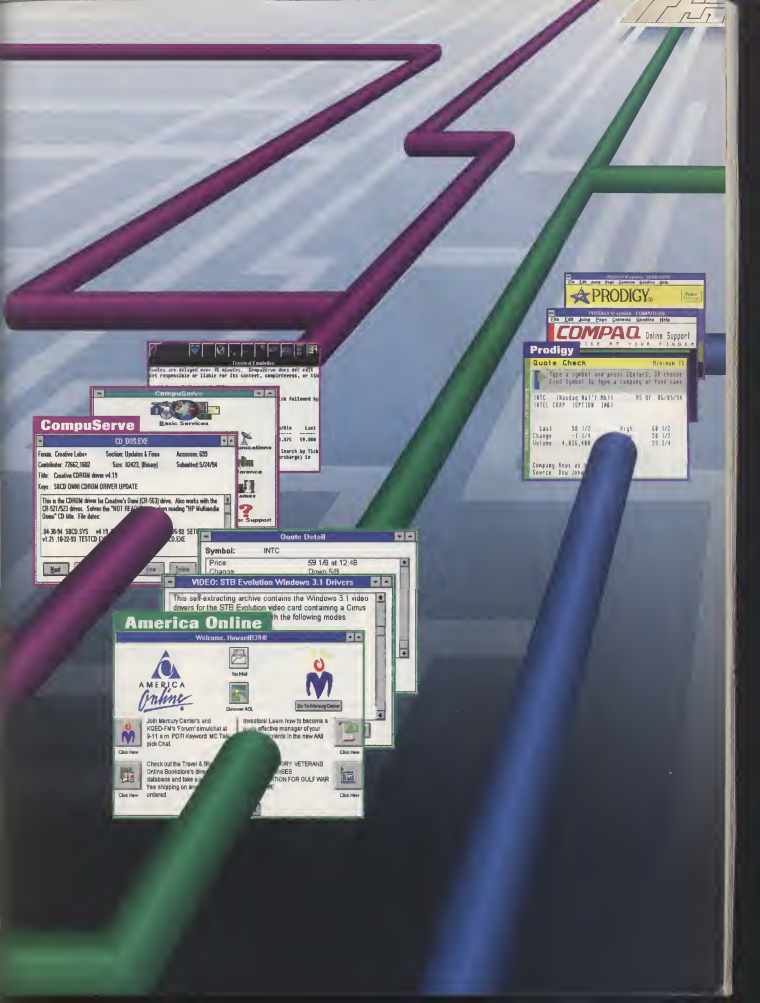
Given that Prodigy and CompuServe claim almost 2 million members, and America Online has yet to hit the million mark, the results of our tests may surprise you. If you'd like to hit the data highway immediately, read on for the best possible road map. Because if you can't figure out how to get at the information, it doesn't matter how much data awaits you online.

BY PRESTON GRALLA

AMERICA ONLINE: Our usability testers rated America Online's clean interface much higher than CompuServe's and Prodigy's. Each service's interface changes daily based on news and other events.

COMPUSERVE: When it comes to downloading patches and technical information, our usability testers gave the thumbs-up to CompuServe's extensive databases.

PRODIGY: This service got the nod from our usability testers for providing the easiest access to trading news, shown here for Intel.



PRODIGY
COMPAQ
Online Support
Prodigy
Quote Check
CompuServe
CD_DOS.EXE
Quote Detail
Symbol: INTC
VIDEO: STB Evolution Windows 3.1 Drivers
America Online
Welcome, Howard8394
AMERICA Online

Please, **Mr. Postman**

In a world of meetings, travel, and quality time for family, e-mail is sometimes the fastest and most convenient way to communicate. Subscribing to an online service is a simple way to tap into an e-mail network, but be sure to check out who you can talk to first.

For sheer elegance of design, as well as functionality, our testers gave America Online the thumbs-up for e-mail. A typical comment: America Online's mail handling is "well-designed . . . one of the best I've seen." It uses a simple screen and makes it clear where addresses, subject, and body text should go. To attach a file to a message, or detach it, you need only to click on an icon. There's a great address book that lets you create groups of addresses, which makes it easy to do a mass mailing.

Although the methods are similar, our testers found CompuServe's mail to be less intuitive than America Online's. It also lets you create groups and attach binary files easily. But sending mail to other services can require a fairly complex addressing scheme that makes it more difficult to use than America Online.

For Prodigy, our testers also reported that the basic layout for mail is confusing, and the capabilities less than adequate. We can't recommend Prodigy if e-mail is your primary interest. As far as the testers were concerned, the less said, the better.

SUMMARY

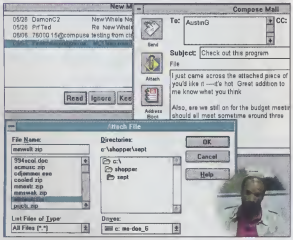
	America Online	CompuServe	Prodigy
Satisfaction	Easy to navigate.	Most tasks are cumbersome.	Interface is cluttered.
Productivity	Users loved it.	*Retain* means *save*, right?	Address book is hard to build.
Help System	All there at your fingertips.	Instructions are too cryptic.	Help rated vague.
Summary	★★★★	★★★	★★

★★★★ *Excellent* ★★★ *Good* ★★ *Acceptable* ★ *Poor* ✦ *Unacceptable*

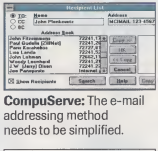
PC USABILITY Tested

Factor 1: **Exchanging E-Mail**

Exchanging e-mail between online services and the outside world is key. America Online took top honors for ease of communication—both within the service and to external addresses.



America Online: Simplicity, power, and logic were all cited by testers as among America Online's strengths when it came to mail handling. Our usability testers noted particularly how easy it was to send attachments and files with messages.



CompuServe: The e-mail addressing method needs to be simplified.

```
This message cannot be read or
may be too long, a file trans
or from a non-PRODIGY ID  Jo
item to a file on your compute

1) select COPY TO DISK for de
2) specify where to save this
3) select [OK]
4) after copy to disk complete
from PRODIGY to view or use th
ITEM  Non-PRODIGY COD Message
```

Prodigy: Don't try sending mail to other systems without additional software.

The Script

How We Tested E-Mail Exchange

We asked our usability testers to initiate and reply to mail in two ways—within the system they were testing and then to an MCI Mail address. They were then instructed to add mail recipients to the electronic address book provided by each service.

Lab Notes

What Our Testers Said About E-Mail

"I experienced difficulty finding information on attaching a text file to a created message in CompuServe."

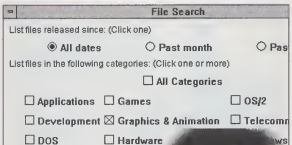
BUS DRIVER

"References to the other services must be delineated in the address line. CompuServe should put this in the help screens."

TECHNICAL SUPPORT MANAGER

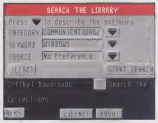
Factor 2: **Downloading Files**

Graphics and data files are the meat and potatoes of online access. Our testers deemed America Online the winner here, thanks to the ease with which they could find what they wanted.



America Online: Our testers cited America Online's excellent search tools as one reason they gave the service such high marks for ease in downloading files and graphics. They also appreciated the point-and-click access to many downloading tasks (for both work and play) that the service offers.

CompuServe: Users were confused by all of the places to look for files.



Prodigy: Searching for files should have been much easier, testers said.

The Script

How We Tested Online Downloading

We directed our testers to the technical support areas where they were instructed to locate a specific file, then download it to the hard drive of the PC.

Lab Notes

What Our Testers Said about Downloading

"I was able to do a 50,000-file search [in America Online] by entering the company name.

NETWORK ADMINISTRATOR

"I liked the fact that if a filename is already on your drive [with Prodigy], this is reported."

MAINFRAME ENGINEER

Beam Me Down, Scotty

The information you seek is out there—it sits on an unknown server, waiting. For many, the lure of online services is indeed that buried treasure of magazine articles, shareware, freeware, and software drivers.

Our testers found it was easier to find and download files on America Online than it was on CompuServe or Prodigy. Keep in mind, though, that the tests covered only the ease of finding and downloading files, not the number of files available. This is where CompuServe surpasses the competition.

It's easier to find and download technical files on America Online because they can all be found under a single umbrella—the Computing and Software area. Once you get there, it can be confusing to figure out where to go next. But handy tools for searching by category, date, and keyword do help.

Downloading files using CompuServe is more complicated at first because there's no central area in which to look—the files are in hundreds of forums across the entire sprawling service. While it may seem disorganized, this is also a strength—more and varied files are available than on the other services.

Our testers found Prodigy slightly more difficult to use than CompuServe. They liked that all of the files were in one location. But once they found the treasure chest they sought, they were a bit confused about how to find the jewels they wanted most.

SUMMARY

	America Online	CompuServe	Prodigy
Satisfaction	Downloading heaven.	Lots of files, but they're hard to find.	All files are in one place.
Productivity	Good tools for swift access.	*Retrieve* means *download*, right?	Once found, files are easy to download.
Help System	Help sometimes didn't.	Help with mark and retrieve is needed.	Unclear on locating specific files.
Summary	★★★★	★★★½	★★½

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Keeping Up-To-Date

Online services have an immediacy that no other medium for delivering information can match. Our testers again gave the nod to America Online, although it was close. Users found Prodigy's stock features more straightforward and easier to use than its competitors, but when it came to travel reservations and news, America Online and CompuServe made up the difference.

Each service has strengths and weaknesses in this area. For example, when you read a news story on Prodigy, you can click on a button that brings you to related articles or displays a photo. Graphics, such as maps, are often included in the stories. Similarly, when you get a stock quote, you can click on a button to get a list of financial news stories about that stock. What sets CompuServe apart from both its competitors is not simplicity so much as depth: There are multiple sources of financial, travel, and news information.

While testers gave America Online another thumbs-up overall, they complained about it occasionally forgoing the Windows interface for a text menu, as it does in its travel reservations area.

What gave America Online the boost was the clarity in its help section. We don't penalize a product when the testers need the help section—we penalize it when the testers don't *get* help when they go looking for it. Here, America Online's documentation gave the best assist, and as a result, got the highest overall productivity ratings from our testers.

SUMMARY

	America Online	CompuServe	Prodigy
Satisfaction	Users hated text interfaces.	Finding quotes is a breeze.	Smooth trip for flight info.
Productivity	News and weather are easy to find.	Capturing info is not as easy as in others.	Users liked the weather format.
Help System	Guidance is found here.	Data came, but didn't help.	Access is clear, but help wasn't.
Summary	★★★★	★★★	★★★

★★★★★*Excellent* ★★★★*Good* ★★★*Acceptable* ★★*Poor* ★*Unacceptable*

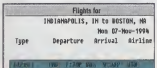
PC

USABILITY Tested

Factor 3: **Staying Informed**

Why wait until day's end for news, weather, and stock reports? Online data is updated as frequently as every 15 minutes—and America Online takes the cake for delivering information sweetly and succinctly.

America Online: This is one area where the rules are being rewritten in electronic distribution of news and information. In addition to the day's headlines, you can get text (but not graphics) of everything from the *New York Times* and *Chicago Tribune* to *Atlantic Monthly, New Republic,* and *Wired.*



CompuServe: Travel arrangements are particularly easy to make.

Prodigy: It's easy to click on a button for related photographs and sidebars.

The Script

How We Tested Weather, Finance, and Travel Data

We asked our usability testers to review stock prices for Intel and Ford, access information about flights between Los Angeles and New York, and get a weather report.

Lab Notes

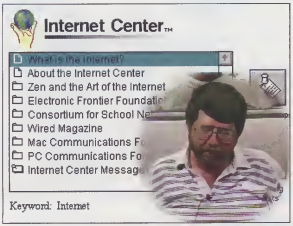
What Our Testers Said about Accessing Data

"The organization of the menus on the [Prodigy] screen is so easy to use, I didn't need Help."
CAD ENGINEER

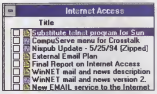
"The [America Online] host gateway interface was difficult to read—a very plain text-based window."
BUS DRIVER

Factor 4: **Accessing the Internet**

There's a difference between sending mail through the Internet and accessing information on the Internet. Any online service member can send mail—getting information requires America Online.



America Online: The only service that offers true Internet access, America Online gives you more than merely the ability to send e-mail. It does the seemingly impossible: gives you point-and-click access to many Internet resources. That way, you don't need to pay extra for Internet access software.



CompuServe: There's a forum for people who have Internet interests.

Prodigy: You can find an Internet glossary and BBS, but no access.

The Script

How We Tested Internet Access

We chose the common capability of sending mail through the Internet and asked our usability testers to send a message to an Internet address and look up President Clinton's Internet address (it's president@whitehouse.gov).

Lab Notes

What Our Testers Said about Internet Access

"Sending mail [on America Online] was very straightforward—except for [figuring out] the Internet addressing. That was not friendly."

NETWORK ENGINEER

"There was a lot of information on how to use it [on Prodigy, but no] details about actually getting into the system."

NETWORK ADMINISTRATOR

Increase Your **Net Worth**

So much ballyhoo surrounds the sudden accessibility of the Internet that an important subtlety gets lost. You can access the Internet—that is, get data from the multitude of servers and databases around the world—or you can use it simply as a medium for e-mail. As you get started in the online world, you're more likely to stick to the latter. That's how we derived our scoring results.

Prodigy and CompuServe only let you send and receive mail through the Internet (with varying degrees of pain). For the most part, our usability testers found sending mail through the Internet difficult because of its unique addressing conventions (see "Getting There from Here," page 154). Even then, finding an address—even for Bill Clinton—wasn't easy. America Online came out ahead because its internal addresses already resemble Internet addresses.

If you want to access Internet data from one of these services, go with America Online. It lets you access some of the popular Internet services: newsgroups, Gopher and WAIS databases, as well as mail and easy-to-use mailing lists. At press time, there were plans to also provide access to FTP and Telnet services.

All this isn't to say that the access to Internet services couldn't use improvement. There should be a way to read and respond to newsgroups offline.

SUMMARY

	America Online	CompuServe	Prodigy
Satisfaction	Trying to find Clinton's e-mail address is frustrating.	Users took a while to figure it all out.	Internet addressing is difficult.
Productivity	Sending to outside services is easy.	Few Internet messages are sent.	Many drawbacks hurt here too.
Help System	Help provided a boost.	Online help is incomplete.	Help is too cryptic.
Summary	★★½	★½	★½

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

More **Bang** for Your **Bits**

The idea behind working offline is simple—when you're not connected, the meter's not ticking, so you're not being charged for "think time." Not surprisingly, it's difficult to work offline with these services—they've been designed to generate income.

CompuServe and America Online let you create mail offline, and then upload it to the service—but our testers found the process wasn't always intuitive. As we were going to press, Prodigy announced it planned a summer release of a Windows-based Bulletin Board Note Manager that will let you work offline more easily.

America Online is the best of the three when it comes to working offline. To do it well in CompuServe, you'll pay extra for CompuServe Navigator for Windows, available for $30 (which includes a $10 usage credit). It works like this: You tell it which forums you like to visit, and the program then downloads the headers—subject lines of messages—to your PC. You mark which messages you'd like to read, and Navigator then goes back online and downloads those messages, which you can read and respond to offline. Working this way, you can easily accomplish in 5 minutes what otherwise might take 30 minutes or more of online time. Translated into dollars, you could save as much as $4 every time you log on.

SUMMARY

	America Online	CompuServe	Prodigy
Satisfaction	Icons give users a good start.	Users found offline work simple.	Users wished offline work was possible.
Productivity	Creating mail is a snap.	Writing and sending is no problem.	No can do without new software.
Help System	Sent users on their way.	Offline capability is not apparent.	Help explained offline work unavailable.
Summary	★★★★	★★★	★½

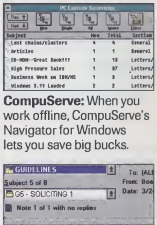
★★★★★*Excellent* ★★★★*Good* ★★★*Acceptable* ★★*Poor* ★*Unacceptable*

PC USABILITY Tested

Factor 5: **Working Offline**

A majority of our users didn't know working offline was possible, so they just logged on and started working. Our testers gave America Online top marks, but check out Prodigy's new offline assistance.

America Online: If you're using America Online, you can write as many messages as you need to before you log on and ship them off—a big money saver. With CompuServe and Prodigy, you'll pay anywhere from $15 to $50 (depending on features) for extra software to do the same thing.



CompuServe: When you work offline, CompuServe's Navigator for Windows lets you save big bucks.

Prodigy: Software for offline work has just been released for Prodigy.

The Script

How We Tested Working Offline

Organizing your e-mail before logging on is a big money-saver. We asked users to write an e-mail message, update their address book with the recipient's name, and then log on. Following intuition, though, the majority of our testers logged on first.

Lab Notes

What Our Testers Said about Working Offline

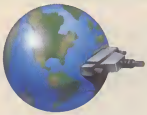
"Using the offline message manager [in America Online] was easy, but [I assumed] you could click on the send icon and be put in the log-on screen; what you get is a dead icon."
BUS DRIVER

"It was not clear that you could create a message without being logged on."
TECHNICAL SUPPORT MANAGER

ONLY $79 U.S.

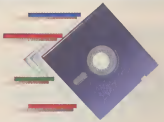
Smartcom For Windows.

We Worked Longer And Smarter To Make It Easier and Faster!



Connect to PCs, Macintoshes®, DEC Vax, Minitel, DataView, or almost anything else

The Editor creates documents with color, ANSI graphics and more



Send and receive files with speed and confidence

Assign edit and program actions, macros, scripts to keys for easy access

Connect to your favorite online service with a keystroke or a click

Available in five languages, Smartcom can be your international standard

Easy enough for novices, sophisticated enough for experts

Accessing E-Mail and editing messages is easy

Automate communications and create custom programs with SCOPE scripting language

Download and view .GIF images, even create slide shows

Supports Hayes® ESP® Communications Accelerator for faster Windows communications

User-defined Smart Buttons do your work for you - fast click!

Finally, communications software that lets you run Windows™ the way you had hoped - easily and quickly. Turn it on and this powerhouse automatically configures the modem, sets the speed, and gets you communicating right out of the box. With Smartcom™ for Windows, you're always getting constant, easy to understand visual feedback on call status and file transfers. *Computer User* says Smartcom ***"fills a gaping hole in the Windows world."***

Since Smartcom for Windows is easier to use, you'll be a speed demon on the job. Our powerful SCOPE scripting automates repetitive tasks to save you time and money with on-line services and mainframe connections. It even has a Learn option that records your keystrokes to automatically create button driven scripts for accessing E-mail, printing, customizing - just about anything. According to *Windows User*, ***"performance will never be a worry."***

With Smartcom for Windows 5 language options, you can finally set the standard for global communications too. It can be used with high-speed modems, ISDN, LANs, Hayes® ESP® Communications Accelerator, and NetBIOS or TCP/IP internetworking.

Call for details on multi-user licensing. Corporate Evaluation Program available. Call 800-934-2937 or use our FAX back service *Hayes Fax Response* at **800-HAYES-FX** and select Document 946. In Canada, call **800-665-1259.**

MICROSOFT® WINDOWS™ COMPATIBLE

Hayes®

Increasing the Speed of Business.®

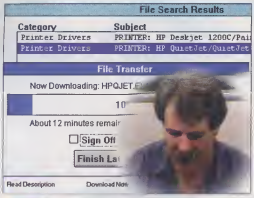
Go *Online with Hayes* BBS; call 800-874-2937 or 404-446-6336.

© 1994 Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. Hayes, the Hayes logo and ESP are registered trademarks and Smartcom is a trademark of Hayes Microcomputer Products, Inc. Other trademarks mentioned are trademarks of their respective companies.

Circle 152 on reader service card.

PC USABILITY Tested

The Most Usable Service



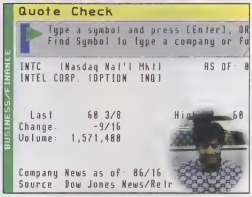
PC USABILITY Approved

America Online: A big winner on fundamentals like e-mail, America Online was also rated "exceptionally easy" when it came to finding and downloading files. ★★★★

How is usability different in word processing than in an online service? The meter is running with online services—you pay for making mistakes. That's why we focused on usability.

Looking strictly at usability, our testers were unanimous. Logical organization, elegant design, and intelligent use of icons and other navigational techniques made America Online a winner.

CompuServe: A runner-up in many categories, CompuServe was most lauded for its ease of access to data and its rich treasure of files. ★★★



Prodigy: Testers raved about Prodigy data services—one said getting stock quotes was so easy, "It must have been written by a stockbroker!" ★★

SATISFACTION: *Prodigy had low ratings here. Why? Users cited the non-Windows interface and advertisements on each screen as thorns. Prodigy is working on a pure Windows look.*

PRODUCTIVITY: *Following our script of a dozen tasks, our usability testers finished a much higher percentage of their tasks on America Online than they did on either Prodigy or CompuServe.*

HELP SYSTEM: *America Online's online help and manual assisted our testers a majority of the time. When testers sought help from other services, they didn't find it in more than half of their attempts.*

SUMMARY: *Even when they didn't like parts of America Online—like its ugly Easy Sabre interface—our testers raved about its simple point-and-click access to the most complex information sources.*

Lab Notes: What Our Testers Said about Online Services

America Online

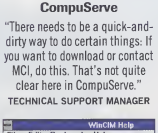
"File downloading was exceptionally easy, [as were] the file search, abstracts, and file descriptions."

BUS DRIVER

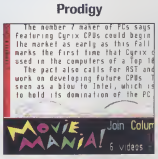
CompuServe

"There needs to be a quick-and-dirty way to do certain things: If you want to download or contact MCI, do this. That's not quite clear here in CompuServe."

TECHNICAL SUPPORT MANAGER



Prodigy



"There are these subliminal messages [onscreen advertising] on the Prodigy screen."

NETWORK ENGINEER

SCORECARD — AMERICA ONLINE CROSSES THE FINISH LINE FIRST

Factor	America Online	CompuServe	Prodigy
1. Exchanging E-Mail *Weighting Factor: 35%*	★★★★ Easy to navigate, attach files, and go.	★★★ Step-by-step instructions, but too cryptic.	★★ Road closed to other online services without add-on software.
2. Downloading Files *Weighting Factor: 20%*	★★★★ Straightforward and user-friendly.	★★★½ Lots of files; hard to find among forums.	★★½ Needs better search capabilities.
3. Accessing Data *Weighting Factor: 20%*	★★★★ Top choice for up-to-date information.	★★★ Unmatched depth of information.	★★★ Testers rated these sections highly intuitive.
4. Accessing the Internet *Weighting Factor: 15%*	★★½ The only one with true Internet access.	★½ No Internet info, and even sending mail is tricky.	★½ Only Internet info is a glossary and a BBS.
5. Working Offline *Weighting Factor: 10%*	★★★★ Easy to compose mail offline.	★★★ Need Navigator software to work offline.	★½ No can do without new software.
Verdict *100%*	★★★★ So easy, it's hard to believe you're online.	★★★ Database depth, but not always easy to use.	★★ Rock-solid for data, but that's it.

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

How We Scored

For every usability-tested story, a script is designed that consists of a set of common business tasks. We report test results in three key areas: user satisfaction, productivity, and help. The satisfaction score reflects users' preferences on a scale of one to five (five is best). The productivity score reflects the percentage of tasks completed, and the help score reflects the percentage of documentation and online help reference that actually helped the testers.

How We Tested

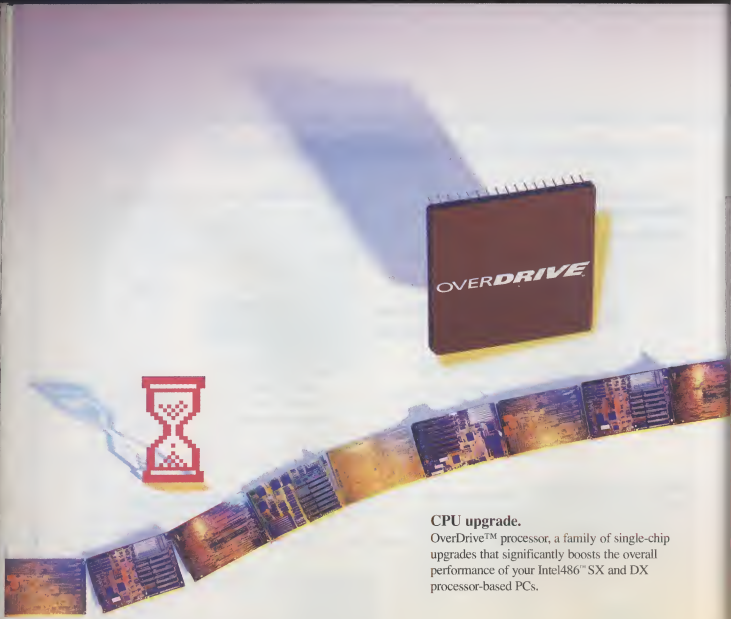
To evaluate the three most popular online services, we brought users of varying backgrounds and levels of experience into our Usability Labs. Some had already used one or more of the online services we were testing; others were seeing them for the first time.

We urged our testers to "think out loud." Some of their "thoughts" appear throughout the article.

Each user was given the same assignments, which took about ten hours to complete. We had them find executable files and updates in the tech support forums and then download them.

We asked our testers to initiate and reply to e-mail in several ways—within the online service they were testing, to an MCI Mail address, and to an Internet address.

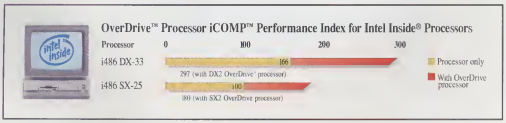
To test the ease of keeping up-to-date, we asked our users to review the stock prices for Intel and Ford, access a list of flights for a Los Angeles-to-New York business trip, and get a weather report.



CPU upgrade.
OverDrive™ processor, a family of single-chip upgrades that significantly boosts the overall performance of your Intel486™ SX and DX processor-based PCs.

Slow performance.
Your software is bogged down, but you can't buy a new PC right now.

To speed up your 486,



Call 1-800-538-3373, ext. 178.†
To find out more about the IntelSX2™ and IntelDX2 OverDrive processors and to receive a free demo disk.

Speeds up software.
Microsoft Excel® 4.0 runs 83% faster and Microsoft Word® 2.0 65% faster when you upgrade a i486™ SX-33 processor with an IntelDX2™ 66 MHz OverDrive processor.

Free OverDrive™ processor demo disk.

To see how much faster your software runs with an OverDrive™ processor, call 1-800-538-3373, Ext. 178 for your free demo diskette. Or simply complete this card and drop it in the mail. Either way, it's the right path to take.

Please answer the following questions to help us better serve you. Thank you.

1. What Intel processor-based system(s) are you currently using?
   i486™SX____ i486™DX____ IntelSX2™/IntelDX2™____
   IntelDX4™____ Pentium™____

2. How many OverDrive processors are you or your company interested in purchasing?
   0____ 1-9____ 10-49____ 50+____

3. When are you interested in purchasing an OverDrive processor(s)?
   0-60 days____ 61-120 days____ 120+ days____

Name_____

Title_____

Company_____

Address_____

City _____State____Zip_____

Daytime Telephone #_____

For inquiries outside the U.S., affix proper postage. European residents may also call +44 (0) 793 431155, and ask for infopack IOD11.

ODBRC4 ©1994 Intel Corporation.

intel® tel®

ECD4032PCC

CPU upgrade.
OverDrive™ processor, a family of single-chip upgrades that significantly boosts the overall performance of your Intel486™ SX and DX processor-based PCs.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
First Class Mail Permit No. 79 Portland, OR

Postage will be paid by addressee

intel®

PO Box 10266
Portland OR 97210-9879

Call 1-800-538-3373, ext. 178.†
To find out more about the IntelSX2™ and IntelDX2 OverDrive processors and to receive a free demo disk.

Speeds up software.
Microsoft Excel* 4.0 runs 83% faster and Microsoft Word* 2.0 65% faster when you upgrade a i486™ SX-33 processor with an IntelDX2™ 66 MHz OverDrive processor.

†For European residents, call +44 (0) 793 431155, and ask for infopack IOD11
© 1994 Intel Corporation *Other brands and names are the property of their respective owners.

follow the upgrade path.

OverDrive™ processor family of products

intel®

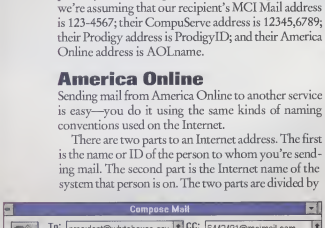
Getting **There** From **Here**

All the online services promise to let you send e-mail to just about everyone on the planet—and it's generally true. That's the good news. The bad news is that it can be an incredibly difficult and frustrating task—one often not worth the effort. But if you follow this primer, the job will be much easier. Note that you'll always have to know the specific e-mail address of the person you're sending mail to. In the examples below, we're assuming that our recipient's MCI Mail address is 123-4567; their CompuServe address is 12345,6789; their Prodigy address is ProdigyID; and their America Online address is AOLname.

America Online

Sending mail from America Online to another service is easy—you do it using the same kinds of naming conventions used on the Internet.

There are two parts to an Internet address. The first is the name or ID of the person to whom you're sending mail. The second part is the Internet name of the system that person is on. The two parts are divided by an @ sign. For example, if you were sending mail to Joe Bigelow on the Othermail.com service, the address would be: JoeBigelow@othermail.com. In Internet parlance, each entity has a three-letter designation. For instance, *.com* stands for company, *.edu* for educational institution, *.gov* for government, and *.org* for non-profit organization.



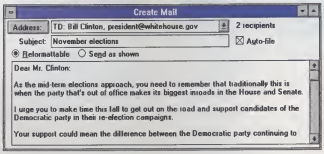
Sending e-mail to President Clinton via America Online and copying someone on another system is straightforward.

Service	Address
MCI Mail	123-4567@mcimail.com OR 123-4567@mci
CompuServe	12345.6789@compuserve.com OR 12345.6789@cis
Prodigy	ProdigyID@prodigy.com OR ProdigyID@prodigy
Internet	name@entity.xxx

CompuServe

Use these formats when you need to send mail from CompuServe to people on another online service:

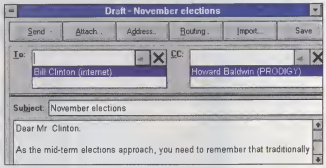
Service	Address
MCI Mail	MCIMAIL:123-4567
America Online	AOLname@aol.com
Prodigy	ProdigyID@prodigy.com
Internet	name@entity.xxx



CompuServe uses addressing conventions that are similar to those of America Online to send mail to other online systems, such as the Internet.

Prodigy

There is no way to send mail to another service from directly within Prodigy. You'll need ConnectSoft's add-on program for Windows, E-Mail Connection for Prodigy, which costs $14.95. There's also a "universal" version that sells for $49.95 and lets you access other e-mail services such as AppleLink, GEnie, EMBARC, and NewsCard through MCI, Prodigy, CompuServe, or LAN-based mail systems. To send mail to other services with it, you need only to know the user ID on the other service; there's no need for complex addressing schemes.



To send mail to other systems with Prodigy, you need ConnectSoft's add-on package, E-Mail Connection.

everything IS NEW.
nothing IS THE WAY it WAS.
it's the wake-UP CALL for a NEW way of WORKING.
TIME TO rise and shine.

INTRODUCING 1-2-3 RELEASE 5. NOW THE LEGENDARY SPREADSHEET BRINGS MORE PEOPLE TO THE NUMBERS AND THE NUMBERS TO LIFE.

1-2-3® has always helped individuals become more productive. Now it goes to a new realm—workgroup productivity. With strengthened ties to Lotus Notes® and new, sophisticated routing features, workgroups are using 1-2-3 Release 5 to make decisions, reach consensus and explore possibilities.

No other spreadsheet has the features of 1-2-3 Release 5. Features that make everyday spreadsheet tasks easier. Features that help you move from task to task fluidly. Maximum productivity, minimum effort.

TAP THE POWER OF NOTES WHEN YOU'RE IN 1-2-3. TAP THE POWER OF 1-2-3 WHEN YOU'RE IN NOTES.

Say you're working on the annual budget in 1-2-3. You can save your spreadsheet in Notes. Then share ideas and information with colleagues working on the same budget at the same time.

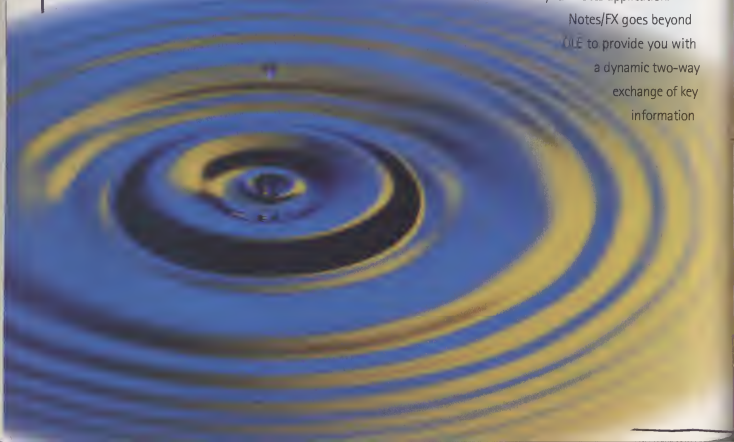
Lotus NOTES READY

Any changes to your spreadsheet are automatically synchronized and distributed thanks to Notes replication technology. Plus Notes' security protects the integrity of your data.

When you're working in Notes and want to crunch numbers, prepare budgets or perform "what-if" analyses, you can launch into 1-2-3 with Notes/FX™ 1.1—to get the power of 1-2-3 right in your Notes application.

Notes/FX goes beyond OLE to provide you with a dynamic two-way exchange of key information

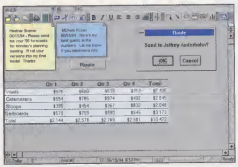
freedom of MOVEMENT, NOT chains of COMMAND.



between Notes and 1-2-3. So you can roll that 1-2-3 information back into any Notes application.

POWERFUL WORKGROUP FEATURES EVEN WITHOUT NOTES.

1-2-3's powerful Version Manager™ lets each person in your workgroup save multiple sets of charts to any name range. So you know the who, what, when and why of every change all the time.



1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

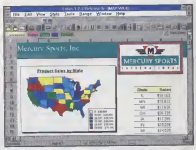
Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to workgroup members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

MAXIMUM PRODUCTIVITY, MINIMUM EFFORT.

1-2-3 Release 5 is packed with innovative new features designed to help you get more done with less effort.

SmartMasters™ are predesigned and customizable templates of everyday business forms—like expense reports, invoices and purchase orders—with built-in intelligence to guide you through common tasks in record time. Or create custom SmartMasters for yourself or your workgroup.



1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

With Lotus Maps you can create instant maps of geographic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet—with one click of the mouse.

One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.

Multi-page Print Preview lets you view up to nine spreadsheets on your screen before you print.

Taken all together, the new 1-2-3 is loaded with enhancements that make getting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. 9970*** for a free demo disk. A 1-2-3 upgrade costs $119.**

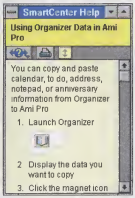
Lotus
Working Together®

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag and Drop, and, of course, Lotus Notes Integration.



Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.

The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and cross-tabs on the market.

Ami Pro® 3.1 offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®[1]), low memory/hard disk requirements (4MB RAM, 15MB for complete installation), with proofing tools, collapsible click and drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.

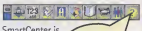
Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you-all you do is point.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and format 1-2-3 data, taking full advantage of Approach's easy-to-use

forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

Combined with Lotus Notes, 1-2-3 Release 5 becomes a model management system that lets team members search a library of worksheets.

Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 9987*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus NOTES READY

the COMMITTEE IS dead. long live the TEAM.

Lotus
Working Together™

SMARTSUITE 3.0

SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)

Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY

1-2-3 RELEASE 5

SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0

PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1

New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

New Style Sheets
(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1

Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance— review and rearrange with ease)

Import/Export
(more file formats than ever— including Harvard/DOS and PowerPoint® 3.0)

ORGANIZER 1.1

Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

how the NEW SMARTSUITE 3.0 HELPS workgroups work.

The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. 9987*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus
Working Together

*In Canada call 1-800-GO-LOTUS. **$119 suggested retail upgrade price. †NSTL, May 1994. ††$299 promotional price available while supplies last. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus, Lotus Notes, 1-2-3, Approach, Ami Pro, cc:Mail, Freelance Graphics, SmartSuite, Smartlcons and Working Together are registered trademarks and ScreenCam, PowerClick, NotesIPX, Version Manager, SmartMasters, Organizer, PowerKey, X10 and NotesReady are trademarks of Lotus Development Corporation. WordPerfect and Switchkit are registered trademarks of WordPerfect Corporation. PowerPoint is a registered trademark and Windows is a trademark of Microsoft Corporation. Paradox is a registered trademark of Borland International, Inc.

FEATURE ROUNDUP

HOW THE ONLINE SERVICES WE TESTED **COMPARE** TO OTHERS

	Additional Costs	Year Founded & No. of Members	Basic Data	Specialties
America Online (800) 827-6364 (703) 448-8700 $9.95 per month for 5 hours. *Reader Service No. 656*	$3.50 each additional hour	1985 900,000	E-mail, news, sports, weather, finance, travel, shopping, and 600 BBSs.	Technical support for 300 hardware and software companies, Internet access, mobile access for pen and palmtop computers, interactive newspapers and magazines.
CompuServe Information Service (800) 848-8199 (614) 457-8600 $8.95 per month includes connection to basic services (e-mail, travel, shopping, finance, and games) plus the equivalent of 60 three-page mail messages. *Reader Service No. 657*	Access to CompuServe forums: $4.80 per hour (billed in 1-minute increments) for 1,200- and 2,400-baud modems, or $9.60 per hour for 9,600- and 14,400-baud modems. Nominal fee for messages to MCI Mail, telex, fax, and postal delivery. Incoming or outgoing Internet messages cost 15 cents for the first 7,500 characters and 5 cents for each additional 2,500 characters.	1979 1.8 million (300,000 accounts; CompuServe estimates six users at each account)	E-mail, news, sports, weather, reference, shopping, finance, games, travel, plus 2,000 databases and discussion groups.	Technical support for 700 hardware and software companies, international service for England, France, and Germany.
Prodigy (800) 776-3449 $4.95 for software shipping and handling; $14.95 per month for 30 e-mail messages and 2 hours on basic features (BBSs, Easy Sabre, Dow Jones Co. News, and stock quotes). *Reader Service No. 658*	Additional messages cost 25 cents each; additional access to the four basic features costs $3.60 per hour. $29.95 per month for 25 hours of bulletin board usage.	1990 2 million	E-mail, news, sports, weather, finance, children's education, and 850 BBSs.	Interactive ESPN, its own news service, music, movies, and other sound clips.
Other Online Services* **Delphi Internet Services** (800) 695-4005 (617) 491-3342 $10 per month for 4 hours; $20 per month for 20 hours. *Reader Service No. 659*	Additional hours cost $4 each on the $10 per month plan, and $9 (prime time) or $1.80 each (off-peak hours) on the $20 per month plan. Prime time access (7 a.m. to 6 p.m., local time weekdays) costs more based on the service used. Internet access costs an additional $3 per month.	1981 100,000	Computer special-interest groups, business and finance information, real-time conferences.	Internet access, custom forums designed by members. Windows interface to the Internet under development.
Dow Jones News/Retrieval (800) 522-3567 $1.50 per 1,000 characters downloaded. *Reader Service No. 660*	Costs for Dun & Bradstreet, Tradeline, and other investment reports vary; corporate flat fees available starting at $500.	1974 200,000	Newswires, industry and financial information, weather, and sports.	Full-text search of more than 1,500 publications; SEC and government data.
GEnie (301) 251-6475 $8.95 per month for 4 hours. *Reader Service No. 661*	Additional hours cost $3 each. $9.50 per hour for access between 8 a.m. and 6 p.m., local time on weekdays. $6 per hour surcharge for 9,600-baud modems. Surcharges vary depending on fax, stock, news, Official Airline Guide, and database access.	1985 150,000	E-mail, Reuters, weather, sports, travel, finance, 240 BBSs, discussion groups.	Internet access, real-time forums, 40 online mail-order stores, access to more than 900 publications. Windows interface now available.
Ziff-Davis Interchange Online Network (617) 252-5000 Expect to pay between $10 and $15 for about 5 hours per month based on subscription to one service (Washington Post Online or Starwave Sports, for example). *Reader Service No. 662*	Additional services will cost extra.	1994 Available fourth quarter	Computing information, news, finance, weather, sports.	User group discussions linked to online reference material.

*THESE SERVICES WERE NOT REVIEWED, BUT THE INFORMATION IS PROVIDED FOR COMPARISON. SOURCES: ONLINE SERVICES AND SIMBA RESEARCH

If the information highway is anything like L.A. freeways you'll need all the help you can get.

You have a fax/modem, network connections and home or office PC and/or notebook with remote capabilities. Everything you need to shift into high gear on today's electronic Autobahn.

But choose the wrong software, and everything could come to a screeching halt.

Fortunately, Smith Micro has a complete line of telecommunication software that's powerful, yet flexible and easy-to-use. Designed for use in today's DOS and Windows environments, it'll have you cruising along in no time at all.

For example, HotLine® — the ultimate telephone management tool — greatly accelerates productivity with auto-dial capabilities and user-defined directories.

HotDisk® overtakes remote control in both speed and efficiency by allowing remote access to a computer's disk drive that's not only faster, but completely invisible to a user at the host's location, as well.

LAN users can keep things moving with CrossConnect® — the cost-effective network solution that lets users gain full remote access through a single computer — and dial out through a shared modem.

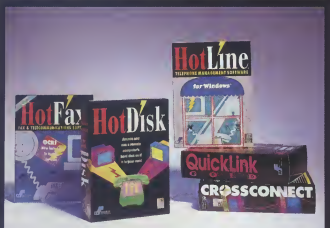
And QuickLink Gold® for Windows and HotFax® for DOS combine fax and data communications in a single, streamlined application.

Available from the same source as QuickLink II™ — the world's most widely used communication software — each product is backed by a proven track record of performance and the industry's most experienced technical support.

So call 1-800-964-SMS! for more information.

Then get ready to hit the highway with telecommunication software from Smith Micro.

SMITH MICRO SOFTWARE



Call for the name and number of your nearest dealer.

QuickLink II is a trademark and HotLine, HotDisk, QuickLink Gold, CrossConnect and HotFax are registered trademarks of Smith Micro Software, Inc. All other trademarks and registered trademarks belong to their respective companies. ©1994 Smith Micro Software, Inc.

Circle 233 on reader service card.

The Best **Way to Go**

While our testers rated America Online the most usable online service, it's not necessarily the best service for everyone. For your particular needs, one of the other online services might be better.

Who delivers the best e-mail service? While any of the services will let you send e-mail to other members, testers found that America Online has the best mail-handling abilities.

Who has compiled the most complete collection of shareware and other downloadable files? The place to turn is CompuServe. Just about all of the scores of special interest forums on CompuServe are stocked full of downloadable files.

Where is the most complete collection of databases? Again, CompuServe is the place to go. You should be prepared to spend some serious money, though: Most of these databases carry surcharges for time spent on them, information retrieved, or a combination of the two—and you can quickly run up some steep bills.

What is the best source of tech support for hardware and software? CompuServe has become the de facto standard online service to use for technical support. Scores of companies—everyone from industry giants like Microsoft to small shareware firms—sponsor forums on CompuServe where you can ask technical questions and download the latest drivers and patches.

Who offers the simplest pricing structure? If the pricing information in the preceding table confused you, you're not alone. One month's charges for e-mail and downloading can stack up. We recommend America Online's simple setup.

Which online service offers the best access to current news, sports, travel, and stock quotes? Our usability testers rated America Online just a nose better, but all do well at presenting weather and current news stories.

PRESTON GRALLA *is the software editor for the Interchange Online Network, an online service set to be deployed by Ziff-Davis later this year.*

DECISION MAKER

WHAT'S THE BEST **ONLINE SERVICE** FOR YOUR NEEDS?

1 Choose the factor most important to you. **2** Choose the next most important factor. **3** What else is important? **4** For your needs, the best product to buy is . . .

E-Mail	Ability to Work Offline	Ease of Downloading Files	America Online
		Ease of Accessing Data	CompuServe
	Internet Access	Ease of Downloading Files	America Online
		Ease of Accessing Data	America Online
Ease of Downloading Files	Technical Support	E-Mail	CompuServe
		Ease of Accessing Data	CompuServe
	Access Speed	E-Mail	America Online
		Ease of Accessing Data	America Online
Ease of Accessing Data	Price	Ease of Downloading Files	Prodigy
		E-Mail	America Online
	Tracking Costs	Ease of Downloading Files	CompuServe
		E-Mail	America Online

The TI TravelMate™ family of notebooks offers the perfect workmate to increase your productivity. Because different kinds of people have very different demands, we have created two series – the 4000E and the 4000M – to meet your individual needs.

Every member of the TravelMate family features a powerful 486 processor – up to 75MHz. Combined with monochrome or brilliant color displays, superb battery life, and a variety of configurations, you can be more productive even when you're on the go.

The perfect desktop replacement. The TravelMate E Series.

Looking for the expansion capabilities of a desktop coupled with the portability and convenience of a notebook? Turn to the TravelMate 4000E Series. Partner the TravelMate 4000E with TI's Intelligent Docking System and you have the ultimate desktop PC replacement. Just insert any of the nine models of TravelMate 4000E notebooks into the Intelligent Docking System, push a button and the auto-load mechanism does the rest. When you're ready to hit the road, simply click an icon and the system saves the files you're working on,

The TravelMate Notebooks Now there's a perfect

TravelMate E Series

- Nine 486 models ranging from a 25MHz to a racy IntelDX4™/75MHz
- 4mm full-travel keyboard with a desktop feel, Microsoft BallPoint™ mouse with QuickPort™ connection
- Desktop Replacement: Intelligent Docking System with 6 ISA and 2 PCMCIA card slots as well as 4 drive bays for additions such as hard drives, CD-ROM, tape drives and more

75MHz now under $4,000*

*Estimated street price, E Series Model. Dealer prices may vary. IntelDX4 is a trademark and the Intel Inside logo is a registered trademark of Intel Corp.

closes Windows™ and ejects your TravelMate 4000E. Then you're on your way – that's true desktop replacement.

A new dimension in portable computing. The TravelMate M Series.

If you're looking for a notebook computer that is multimedia-ready, TI brings you the new TravelMate 4000M Series. From the moment you see our TravelMate 4000M, you'll appreciate how much performance it packs into its sleek new design and conveniently located integrated pointing device.

Add the light-weight, battery/AC-powered Portable CD-ROM Docking System and you have an integrated portable multimedia system. Now you can tap into the growing library of information and applications available on CD-ROM. Use the TravelMate 4000M as an incredibly powerful presentation tool, training or auditing system and more – complete with sound and full-motion video capability.

To find out how you can get together with the ideal TravelMate, just call **1-800-TI-TEXAS** (1-800-848-3927).

from Texas Instruments. mate for everyone.

TravelMate M Series

- Six 486 models ranging from a 25MHz to a racy IntelDX4™/75MHz
- Built-in PCMCIA slot, integrated pointing device, SCSI II interface, 16-bit sound, internal microphone and speaker, and a 16-bit MIDI port
- Portable CD-ROM Docking System option with a double-speed CD-ROM drive and built-in stereo speakers

EXTENDING YOUR REACH™

TEXAS INSTRUMENTS

TravelMate and "Extending Your Reach" are trademarks of Texas Instruments. Windows, BallPoint and QuickStart are trademarks of Microsoft Corporation © 1994 TI

Circle 163 on reader service card.

Dialing For Data

SYNOPSIS

FEDWORLD: *Tax dollars turned into useful information.* **167**

SOFTWARE CREATIONS: *Voted the best for its games—but oh, those Windows tools!* **167**

AUDIOPHILE NETWORK: *Buying tips on stereo and video goods.* **167**

WINDOWS ONLINE: *1.4GB of troubleshooting tips.* **168**

HOUSENET: *Hits the nail on the head for home improvement.* **168**

INFOBOARD: *Learn how to start a BBS.* **168**

DALLAS REMOTE IMAGING GROUP: *Reach for the stars.* **169**

GREENPEACE ENVIRONET: *Keep up-to-date on endangered species.* **169**

Silently, while no one was looking, a rich system of pit stops got built out on the outskirts of the I-Way. Think these pit stops are boring blips for roadkill and little else? Think they're just information cul-de-sacs? Think again. Every day, millions of businesspeople get off the beaten track and make their way down these teeming avenues of information. Their destinations range from purely practical business to exotic esoterica.

We're talking about the remarkable phenomenon of the electronic bulletin board service. Anyone can dial into these BBSs, which range from organizations with dozens of incoming phone lines to one-line, mom-and-pop shops run as a hobby. The typical BBS offers shareware (software you try for free, then pay for if you use it); freeware (software you may use for free); graphics and text files available for downloading; message areas where you can talk about common interests; e-mail capabilities; and online newsletters and databases. BBSs have become so popular that they have their own monthly magazine, *Boardwatch* (800-933-6038), which highlights the latest online happenings and lists hundreds of BBSs. You can also dial into the magazine's own BBS (303-973-4222).

For a bulletin board of bulletin boards, check PC Contact on ZiffNet for BBS.ZIP; it's updated every two months. Once you become a BBS fanatic, you're sure to find hidden treasures of your own. Tell us in 50 words or fewer how your favorite saved you time and money or solved a business problem, and we'll publish the results in a future issue (see page 10 for contact information).

To get you started, we've provided a road map of some BBSs that we've found—both useful and unique. Some stock the raw fuel that's making the information age roar; others we offer just for fun. Also check out the etiquette tips on page 169.

So crank up your modem; set the communications parameters to no parity, eight data bits, one stop bit; and let's ride.

BY PRESTON GRALLA

THE ROAD: Use your communications software, modem, and passwords to get into a character-based world that's much smarter than it is beautiful. Write down your password—it's your driver's license.

WHEN IN ROME: Obnoxious flaming or SHOUTING is frowned upon. Hey, bozo—that's *:o) in BBSspeak—learn your emoticons. They're great shortcuts for communication.

KNOW YOUR SYSOP: That's short for system operator—the traffic cop who keeps communication civil and running smoothly. See page page 169 for more details.

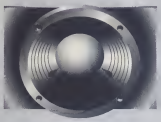
FedWorld

Users: Policy wonks and information junkies • (703) 321-8020 • Free • Reader Service No. 663

Believe it or not, the federal government has actually done something right: The almost unimaginable amount of data it compiles is available here electronically.

First, it's a straightforward BBS, a revealing window into the morass of federal data. Want the details on Clinton's health care plan, already indexed for a keyword search? How about abstracts describing government-approved patents?

Second, FedWorld is a gateway to more than 100 other government-agency bulletin boards. We're not just talking about bureaucratic minutiae—these boards provide important information on passports, travel alerts, toxic waste dumps, and economic trends. Use and enjoy FedWorld—after all, your tax dollars are paying for it.



SOFTWARE CREATIONS

Users: Game and shareware addicts • (508) 368-7036 • $45 per year • Reader Service No. 664

Software Creations was voted the best BBS in the country by readers of the online world's bible, *Boardwatch*. Why? It has become the primary distribution point for many game vendors. Also here: an astonishing collection of shareware, freeware, and graphics files for downloading—perhaps the most extensive we've seen. There are more than 150 discussion areas on the board culled from the Internet, including several covering shareware games.

Audiophile Network

Users: Audio, video, and stereo junkies • (818) 988-0452 • $24 per year • Reader Service No. 665

If you're as fanatical about audio equipment as you are about your computer, the Audiophile Network will be music to your ears. It's the place to go to talk about woofers, tweeters, and state-of-the-art audio equipment—and increasingly, about video hardware as well.

You can also order virtually any kind of audio gadget online. For used equipment, check the classified ads section or post a "component wanted" message. An online version of the Orion Audio bluebook helps determine fair prices for used equipment. Can you imagine the speaker systems that users of this BBS have wired to their PCs?

DATA GAMES DISCUSSION GROUPS

Windows Online

Users: Windows fiends and OS/2 cultists • (510) 736-8343 • $69.95 per year to $109.95 per year (depending on time connected and files downloaded) • Reader Service No. 666

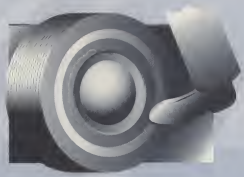
Are you a Windows nut? Then dial in to Windows Online's inconceivable cornucopia of Windows files. When we last checked, it had more than 12,000 files (almost 1.4GB of storage space) available for downloading. That doesn't include the files on Windows NT (22MB worth) and OS/2 (220MB worth).

For the lost, there are also help files from Microsoft and Compaq Computer, among others, to troubleshoot hardware and software problems. Other files are stuffed with technical tips. A great Windows shareware newsletter is available in Windows' Help format.

HouseNet

Users: Mr. and Ms. Fix-its • (410) 745-2037 • Free • Reader Service No. 667

Hit the nail on every household topic under the roof: how to weather-strip, install a roof vent, add a security door, make compost, seal an asphalt driveway, remove a slab of concrete, or hang wallpaper like a pro. Discussion groups target every room of your home. (But how do you tell your friends that you're part of a bathroom discussion group?) If the idea of knocking down walls, laying plaster, and running electrical wires makes your heart beat faster, here's where you'll find the proper tools.



INFOBOARD

Users: Bargain seekers and potential BBS designers • (617) 581-5287 • Free • Reader Service No. 668

Now here's a nifty new way to shop for software over the phone—not by voice, but over your modem. Once you've done your digital tire-kicking, ordering through InfoBoard nets you substantial discounts.

InfoBoard also includes a database of country inns and bed-and-breakfast lodgings in the Northeast. Some of them give you a 10 percent discount if you mention InfoBoard. Unfortunately, you can't make your reservations by e-mail.

If these two databases sound unrelated, they are. InfoBoard is run by a company that creates databases and front ends for other BBSs. The combined service is a prime example of the work they do. Interested in starting your own BBS? Talk to these folks first.

DATA GAMES DISCUSSION GROUPS

Greenpeace Environet

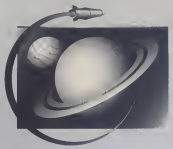
Users: Environmentalists and other activists • (415) 512-9120 • Free • Reader Service No. 669

If you worry about excessive timber logging in Thai forests, violations of nuclear waste agreements in Russia, or the lack of proper environmental scrubbers in Mexican coal-burning plants, then you'll want to check out the Greenpeace Environet. Run by the environmental watchdogs, it keeps you up to date on every environmental danger you've ever imagined—and some you haven't. Download environmental bulletins from around the world. Research alternate energy sources. If it's threatened, it's documented here.

DALLAS REMOTE IMAGING GROUP

Users: Astronomers and space lovers • (214) 394-7438 • $35 per year • Reader Service No. 670

If there's something you're interested in up there, you'll find information and someone to talk to about it down here. There are message areas devoted to space, NASA, and satellite tracking, as well as special bulletins on space-related news. It's almost like being able to dial in to the satellites themselves, because among this BBS's files, you'll find a mind-boggling number of astonishing photos taken from space. Download Landsat (land satellite) photos of Yellowstone National Park when it was ablaze in 1988, or photos taken from the space shuttle Discovery. This will rekindle your old sense of wonder about the heavens.



Know before You Go

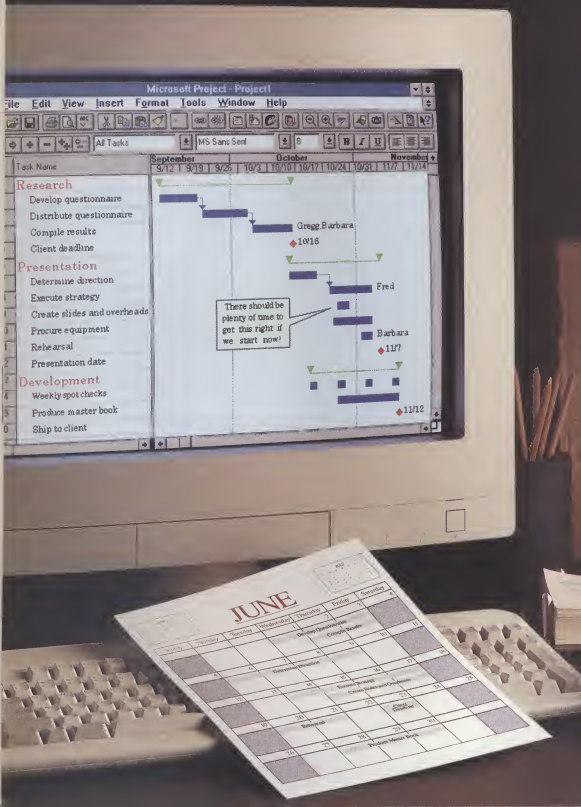
Before you roar down the fast lane of the Information Superhighway, learn the rules of the road. To begin with, the usual communications software settings are no parity, eight data bits, one stop bit.

Remember that bulletin boards are not pretty. As a rule, you navigate through them by choosing items from character-based menus. When you first log in, you'll be asked to type in your name. Next you'll be asked to enter a password. After you enter it, write it down somewhere; if you forget it, you won't be able to log in again without reregistering.

Once you're there, note the local customs. Typing in uppercase letters is the EQUIVALENT OF SHOUTING IN PUBLIC. Use emoticons—keyboard shortcuts you read sideways—to express your feelings in a faceless environment. The smiley face . . . :-) . . . is the most common. Use the winky . . . ;-) . . . to punctuate a joke. Use this . . . *:o) . . . if you think someone's a bozo. The more you travel, the more emoticons you'll discover.

Some folks abuse the ability to communicate somewhat anonymously online and so they flame—carry on in an obnoxious, offensive manner. Don't do it. Bulletin boards are run by people known as sysops (system operators). If you start flaming, they may ask you to knock it off in a private message. Ignore them, and you could lose your privileges.

THE CALENDAR HAS BEEN AROUND FOR 6,000 YEARS. WE FELT IT WAS TIME TO IMPROVE IT.



Introducing new Microsoft® Project version 4.0.

As long as people have had things to plan, they've always looked for better ways to organize and manage the process.

Now there's software that helps you do it more effectively than ever.

It helps you plan, manage and communicate with ease.

With new Microsoft Project, planning is easier than you ever imagined. Simply type a list of what's to be done. By whom. And how long they'll need.

Your plan is automatically converted to easy-to-read reports. Calendars. And charts. (Like the examples you can see at the left.)

It watches how you work and guides you step by step.

Like other programs in the Microsoft Office family, Microsoft Project features IntelliSense™ technology. Simply stated, your software now senses what you want to do and helps you do it.

For example, PlanningWizards offer suggestions as you go, to help you avoid problems down the line.

Cue Cards help you set up your plan with step-by-step instructions that stay on the screen as you work.

With GanttChartWizards, you just choose a great-looking format and it does the rest. (Just like the ChartWizard in Microsoft Excel.)

What's this all mean? Simply that you can get started right away. And learn as you go along.

Now it's easy to keep everyone in the loop.

Chances are you're not the only one working on the project. Microsoft Project was developed with this in mind.

You can now distribute reports through your existing electronic mail system*. Click on a button to collaborate. Click to delegate. Click to get the status of your plan. Even set reminders on important tasks.

To do all this (and a lot more) all you have to do is take the first step: Call Microsoft at (800) 671-3955, Dept. KZ5, for more information or for the name of a reseller near you.

You'll wonder how you ever managed without it.

The world's most popular business project planning software just got better with Microsoft Project version 4.0.

Microsoft

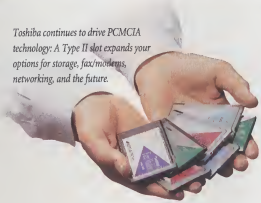
*Some workgroup features require MAPI compliant mail systems, acquired separately. © 1994 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and IntelliSense is a trademark of Microsoft Corporation. In the 50 United States, call (800) 671-3955, Dept. KZ5. Customers in Canada, call (800) 563-9048. Outside the 50 United States and Canada, call your local Microsoft subsidiary or (206) 936-8661.

Compact and lightweight — at just 4.4 lbs. The Portégé Series has been engineered to the extremes of portability without compromising usability.

DEFY THE LAWS OF SPACE AND TIME.

The new AccuPoint™ isometric pointing device works in conjunction with click and drag buttons located comfortably beneath the thumbs.

Toshiba continues to drive PCMCIA technology: A Type II slot expands your options for storage, fax/modems, networking, and the future.



INTRODUCING THE ULTRAPORTABLE PORTÉGÉ.

Never before have computers so perfectly balanced mass and speed. Now you can travel with a system smaller than a notebook—yet graced with the power and feel of a full-size computer. The ultraportable Portégé is driven by the full force of a high-performance i486™ processor, is equipped with a 250MB HDD and a high-endurance Lithium-Ion battery, and shines with Toshiba's renowned color active matrix display. There's even an optional Port Replicator for simple, single-point connection to your desktop environment. See how far we've taken every aspect of portable computing. Then, think where it can take you. **Call 1-800-457-7777 for your nearest dealer.**

PORTÉGÉ

THE SHAPE OF THINGS TO GO.℠

Toshiba discovers the secret to longer life: The ultra-lightweight Li-Ion battery, with up to 6-hours of battery life, is the ultimate in power-per-ounce.

Generous 8.4" and 7.8" active matrix displays (on the T3600CT and T3400CT, respectively) deliver 256 SVGA colors.

intel inside

Portégé T3600CT
- 50MHz i486™DX2
- 8.4" dia. color TFT-LCD active matrix display—256 color SVGA
- 8MB RAM (expandable to 24MB)

Portégé T3400CT
- 33MHz SL Enhanced i486™SX
- 7.8" dia. color TFT-LCD active matrix display—256 color SVGA
- 4MB RAM (expandable to 20MB)

Both Models
- 250MB HDD
- Lithium-Ion battery
- Type II (5mm) PCMCIA slot
- 4.4 lbs.—7.9" x 9.9" x 1.8"
- VL local-bus video
- AccuPoint™ integrated pointing device
- Integrated BitBLT graphics accelerator
- Ports: serial, parallel, FDD, and VGA adapter
- Optional Port Replicator
- MS-DOS®, Microsoft Windows™ and CommWorks™ for Windows

3 YR LIMITED WARRANTY

In Touch with Tomorrow

TOSHIBA

© 1994 Toshiba America Information Systems, Inc. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. The Intel Inside logo is a trademark of Intel Corporation.

Circle 215 on reader service card.

Super Systems

SYNOPSIS

OUTLOOK: *How these Pentiums will run Windows 4.0.* **176**

TECHNOLOGY FORECAST: *Waiting for PowerPC is a gamble.* **177**

BEST OF BREED: *Polywell's Poly 586-90VL flies.* **177**

LAB NOTES: *Our tests show they run fast and cool.* **178**

A CLOSER LOOK: *Hands-on reviews of the first supersystems.* **180**

FINAL ANALYSIS: *Why Pentiums are the smartest upgrades around.* **203**

DECISION MAKER: *Choose the supersystem that best meets your business needs.* **203**

So much for simplicity. Time was, a system upgrade meant buying the fastest CPU Intel offered, paying polite attention to a few excellent *x*86 chip clones in the wings. No more. A menagerie of chips has come into play, and each promises double the performance of a 66MHz 486DX2, whether on today's 16-bit applications or on the 32-bit variety coming down the pike. Take our word for it: Computing will never be that simple again.

If you were willing to bet the farm on which 32-bit operating system is going to prevail in the coming months—as determined by the applications that flock to it—your choice would be easy. But most of us aren't so cavalier. We want safety *and* performance, today and tomorrow, regardless of the operating system we use.

This partly explains our attraction to the Pentium—the 90MHz version, in particular—for the price-to-performance ratio it offers. With multimedia creeping into word processors and spreadsheets, with 24-bit graphics taking over business reports, with voice annotation and video coming to e-mail, and with OLE 2.0 and animated help facilities coming to all applications, your need for more horsepower is only going to grow over the next few months. Count on it. While the Pentium doesn't provide true RISC performance—as Motorola's PowerPC and Digital Equipment Corp.'s Alpha do—it runs Windows NT and OS/2 like a dream. And there's every reason to believe that it will also run the forthcoming 32-bit version of Windows up to par as well. Microsoft is even reported to be working on a Pentium-specific version of Windows 4.0 (see "How They'll Run Windows 4.0," page 176).

Pentium isn't the only platform to consider, of course, but there's a very compelling reason to think about it: price. Prices on the 90MHz Pentium systems in this roundup start at just over $3,000. Each of these systems includes at least 16MB of RAM, half a gigabyte or more of storage, a video accelerator on local bus, and

BY MARTY JEROME

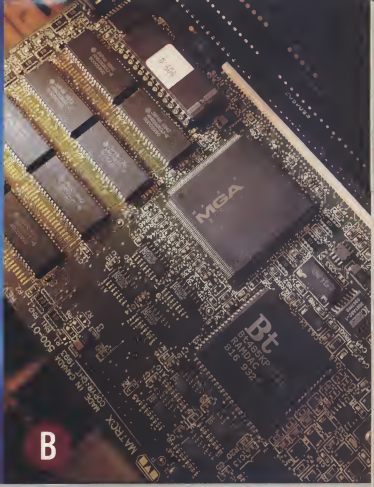
A STANDING TALL: Most 90MHz supersystems come in huge tower cases, leaving plenty of room for expansion.

B DETAILS: Speedy graphics cards and disk drives are key to top-notch Windows performance.

C THE TEMP: Worried about overheating? Chill out. These Pentiums run 10 to 35 degrees cooler than 66MHz 486DX2s.

D MULTIMEDIA MIGHT: 17-inch monitors, 16-bit sound, and CD-ROM drives are common options.

PHOTOGRAPHS BY STAN MUSILEK



RIP 486: Today's 90MHz Pentiums are a mightier, faster bridge to 32-bit computing.

Future Watch: Pentiums and Windows 4.0

a dual-speed CD-ROM drive—all the right pieces for today's business applications. Stock a 100MHz DX4 CPU with the same goodies, and the price difference between 486 and Pentium boxes is negligible. By December the difference is likely to vanish. What's the Pentium's advantage? A mightier, faster bridge to 32- and 64-bit computing.

Cold Warrior Price cuts on the Pentium CPU have come faster than anyone expected, thanks to the raging chip wars. Just months after introducing the clock-tripled 100MHz DX4 CPU, Intel quietly began shuffling it off to portables, hoping to bolster the Pentium's position as the new desktop standard. Now that concerns about overheating have evaporated (the systems we tested run cooler than clock-doubled 66MHz 486DX2s; see "Too Hot to Handle?" page 179), the Pentium faces a very bright future indeed.

Where are its rivals? The PowerPC awaits faster Windows emulation before it will pose a serious challenge (see "The PowerPC Gamble" page 177). Although Motorola's 100MHz PowerPC 604 chip, introduced in April, performs nearly 60 percent faster than a 100MHz Pentium in native processing tasks, it runs *x*86 applications at about the same speed as a 25MHz 486SX—and only in standard mode at that. Windows users will be disappointed.

Digital Equipment Corp. put all of its chips on Windows NT with its splendid but pricey Alpha machine. But as yet, mainstream software vendors aren't rushing to rewrite their applications for NT. DEC recently released its DECchip 21066, a cheaper, less powerful version of the 166MHz Alpha with PCI circuitry and a memory controller built right into the chip design. It performs on par with the Pentium and would be a fine alternative if NT ever becomes a mainstream product (not likely). Meanwhile, chip offerings from Cyrix, NexGen, Texas Instruments, and Advanced Micro Devices weren't even in fabrication as we went to press.

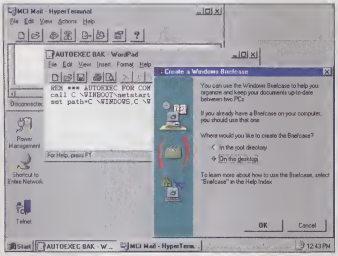
The Pentium's Payoff Does this mean that Pentium owns the future of 32- and 64-bit computing? For the foreseeable future, yes. As *PC Computing*'s lab tests confirm, the bang for the buck of Pentium systems now on the market is unbeatable. Zeos's Pantera 90—$3,195 in the configuration we tested—sailed past every other system in our component-level Windows performance tests (but dropped to seventh place in applications benchmarks, due to a slow hard drive). Polywell's Poly 586-90VL ($3,900) delivers roughly twice the performance of Compaq's 66MHz 486DX2-based ProLinea MT 4/66 CDS when running Windows applications. So do Gateway 2000's P5-90 ($3,999) and Sirius's SST P5-90VL ($4,200).

It's no surprise that half of the machines we tested come standard with 16-bit sound cards in addition to CD-ROM drives. Regardless of the operating system you use today, data types are growing richer in business applications and the reports, databases, project proposals, and other files you create with them. The systems we tested traffic this type of complex information at speeds that are unthinkable on 486-class PCs.

Pentium systems also ease growing pains. With high-bandwidth networking technologies like Fast Ethernet and asynchronous transfer mode (ATM) on the very near horizon, network managers have enough performance bottlenecks to worry about without lackadaisical clients tripping up the show. Contrary to popular belief, fast Pentiums reap more network performance gains as desktop systems than as servers (which rely heavily on fast I/O, high-speed disk drives, and acres of RAM cache instead of processor might).

Of course, every new generation of supersystems has promised better performance and longer investment protection. What distinguishes the machines in this roundup is that they also offer superb dollar value. If they convince you of anything at all, it's that you should never buy another 486 PC again.

OUTLOOK HOW THEY'LL RUN WINDOWS 4.0



Pentium-Ready? Chicago, a.k.a. the 32-bit version of Windows, isn't due to hit the streets until the beginning of next year, but sources tell us that Microsoft is quietly and feverishly at work on a version of Windows 4.0 optimized for the Pentium processor. (Microsoft officials would say only that the company is "looking at all kinds of options.") Though largely 32-bit, Windows 4.0 will still contain some 16-bit code brought over from Windows 3.*x*. A Pentium-optimized version of it would keep the performance penalty of this 16-bit code to a minimum. It could also boost the performance of preemptive multitasking, OLE 2.0, and other CPU-intensive operations. But will Microsoft bring the product to market? We should know by the end of the year.

Technology Forecast: The PowerPC Gamble

1. Apple's **PowerPC-based** Power Macintoshes run native applications as fast as 90MHz Pentiums.
2. Forthcoming PowerPC systems from IBM will outpace Pentiums—but only in **32-bit applications.**
3. For today's Windows business applications, the **90MHz Pentium** is still the best buy.

Rave about Pentium performance all you like, there's no substitute for true RISC computing. Just ask any software developer. Unfortunately, today's business applications must be recompiled to put a RISC chip's horsepower to work. And for most of us, business applications are where the rubber meets the road. There are already several fine RISC contenders to choose from. DEC's 166MHz 21064 Alpha chip and Mips Technologies' 150MHz R4400 both run Windows NT and provide far faster performance than the Pentium. Until more software vendors rewrite their applications for Windows NT, however, neither chip is expected to unseat the Pentium.

The RISC Advantage Not so for Motorola's PowerPC, a true RISC CPU that runs Apple's Macintosh operating system, as well as Windows. Muscle-bound backing for the chip from both IBM and Apple will likely persuade software vendors to recompile their applications to run in the CPU's native mode.

Power Macintosh Based on the 80MHz 601 version of the PowerPC chip, Apple's first Power Macintoshes are roughly as fast as 90MHz Pentiums when running native PowerPC applications (see "Life Begins at 100MHz," July 1994, page 118). Windows, on the other hand, runs only in 286 emulation through Insignia Solutions' SoftWindows, which means that it runs Windows in standard mode only. Translation: The Windows applications you use today will run faster on a no-frills 33MHz 486—never mind how fast they run on a 90MHz Pentium (which costs about the same as a Power Macintosh).

IBM's PowerPC Due later this year, IBM's PowerPC-based systems will use a version of the 100MHz 604 chip which runs nearly 60 percent faster than a 100MHz Pentium in native mode. Windows performance is helped, too, although even IBM officials concede that performance of 16-bit applications will be the equivalent of a 66MHz 486DX2. Meanwhile, Intel plans to upstage its 90MHz and 100MHz Pentiums in late 1995 with a next-generation chip code-named the P6, which will run at speeds of 150MHz or higher and be capable of 250 million instructions per second (mips)—roughly 60 percent faster than today's speediest Pentiums. At about the same time, Motorola will release its PowerPC 620 chip, which is expected to double the performance of the 604.

We'll Take Pentium So goes a never-ending game of leapfrog. Dollar for dollar, the Pentium offers the best performance you can buy for today's business applications. This may change when—and if—software vendors begin to recompile their applications for the PowerPC. But that's a high-stakes horse race that won't be played out for at least two years. For now, we'll place our bets on the Pentium.

PC Best

90MHz Pentium

Polywell Poly 586-90VL

PERFORMANCE: We've got a few nits to pick with the Poly 586-90VL, but no other system delivers as much performance for the dollar.

PRICE: Even those who've grown jaded to CPU power will do a fast double-take when they see what Polywell puts in a system that costs less than $4,000.

DESIGN: From its 64-bit graphics accelerator to its 4MB IDE caching controller, Polywell's Pentium is painstakingly engineered to put the pedal to the floor.

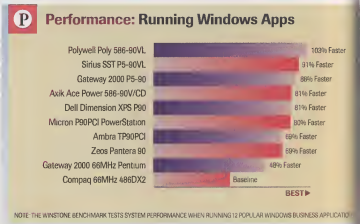
BOTTOM LINE: The Poly 586-90VL pushes today's 16-bit applications along at a breathless pace. Expect commensurate performance from 32-bit operating systems.

Poly 586-90VL / Polywell Computers / (800) 999-1278 / (415) 583-7222 / $3,900
Circle No. 686 on Reader Service Card

Lab Notes: What the Numbers Mean

How to Get **Ahead**

Our lab tests confirm it: The bang for the buck of 90MHz Pentiums is unbeatable. Polywell's $3,900 Poly 586-90VL delivers twice the performance of Compaq's 66MHz 486DX2-based ProLinea MT 4/66 CDS (which, incidentally, costs $4,199); so do Gateway 2000's $3,999 P5-90 and Sirius's $4,200 SST P5-90VL. Even comparatively slow Pentiums such as Ambra's $4,032 TP90PCI and Zeos's $3,195 Pantera 90 are nearly 70 percent faster than 486s. Likewise, 90MHz Pentiums are as much as 37 percent faster than 66MHz Pentium systems like Gateway 2000's $3,795 P5-66, yet cost only a few hundred dollars more.

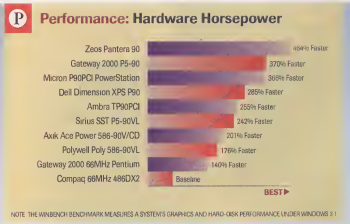


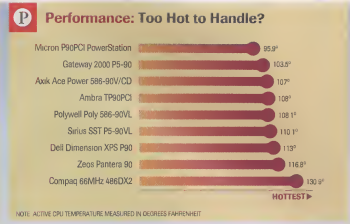
GUI Wizards: All of the 90MHz Pentiums we tested zipped through our test suite of Windows applications at breathtaking speeds, as much as 103 percent faster than a comparably configured 66MHz 486DX2. The 90MHz Pentiums from Polywell, Sirius, and Gateway 2000 led in overall applications performance.

The Inside Story on Speed

CD-ROM Drives, Sound Cards, and High-Resolution Graphics Cards Drive the Show

	Ambra TP90PCI	Axik Ace Power 586-90V/CD	Dell Dimension XPS P90
Price (Configuration Tested)	$4,032	$4,258	$4,199
CPU Cache	256K	512K	256K
Hard-Drive Capacity (Configuration Tested/Max.)	540MB/1GB	540MB/9GB	1GB/1GB
Hard-Drive Controller	PCI IDE	VL-Bus IDE, 4MB cache	PCI IDE
Local Bus	PCI	VL-Bus	PCI
Memory (Configuration Tested/Max.)	16MB/128MB	16MB/128MB	16MB/128MB
Graphics Card	Diamond Viper, 2MB VRAM	Diamond Viper, 2MB VRAM	Number Nine #9GXE64 Pro, 4MB VRAM
Monitor	FST Ambra (17-inch)	ADI Microscan 5A (15-inch)	Dell UltraScan 17ES (17-inch)
Sound Card	Media Vision Pro Audio Spectrum 16	Optional	Creative Labs Sound Blaster 16
CD-ROM Drive	Philips LMS-206 dual-speed	NEC CDR-510 triple-speed	Panasonic CR-563 dual-speed





Brute Force: Zeos's Pantera 90 muscled ahead in this component-level Winbench test, thanks to its spry Diamond Viper graphics card; however, a sleepy hard drive held it back in application tests. Gateway 2000's Pentium was more consistent; it raced ahead in both applications and component tests.

Just Right: Dare to touch a 90MHz Pentium chip while the system is running, and you'll burn your finger. Even so, with the Pentium's new 3.3-volt low-energy design and a generous use of heat sinks and fans, 90MHz Pentium systems run cooler than clock-doubled 66MHz 486DX2 machines.

Gateway 2000 P5-90	Micron P90PCI PowerStation	Polywell Poly 586-90VL	Sirius SST P5-90VL	Zeos Pantera 90
$3,999	$3,999	$3,900	$4,200	$3,195
256K	256K	512K	512K	256K
540MB/1.2GB	540MB/2GB	540MB/9GB	550MB/2GB	528MB/2GB
PCI Enhanced IDE	IDE	VL-Bus IDE, 4MB cache	VL-Bus IDE, 4MB cache	PCI IDE
PCI	PCI	VL-Bus	VL-Bus	PCI
16MB/128MB	16MB/192MB	16MB/128MB	16MB/128MB	16MB/192MB
Matrox MGA, 2MB VRAM	Matrox MGA, 2MB VRAM	Orchid Kelvin 64-VLB, 1MB DRAM	Weitek P9000, 2MB VRAM	Diamond Viper, 2MB VRAM
Gateway 2000 CrystalScan 1776LE (17-inch)	Mag InnoVision MX17F (17-inch)	Sampo (15-inch)	CTX 1760 (17-inch)	Zeos (15-inch)
Gateway 2000 Sound Galaxy Pro	Optional	MediaMagic 16	Optional	Optional
NEC CDR-510 triple-speed	Mitsumi FX-001D dual-speed	Philips OEM-205 dual-speed	Mitsumi FX-001D dual-speed	Mitsumi FX-001D dual-speed

90MHz Pentium: Ambra TP90PCI

Slow Song

USABILITY: *Plug-and-play multimedia.*
PERFORMANCE: *Slower than other systems in its class.*
TECHNOLOGY: *Faster video would help.*
VERDICT: *Not a bad package in its basic configuration.*

FILEBOX

Ambra TP90PCI

Pros: Dual-speed CD-ROM drive, 16-bit sound, and a bright 17-inch display.

Cons: Slow (and pricey) for its class.

Suitability: Not the fastest Pentium. The $2,739 basic model is a better buy.

$4,032
Ambra Computer
(800) 252-6272
Reader Service No. 675

Ambra Computer waits for no one—including its parent company, IBM. The TP90PCI minitower (the system also comes in a desktop case) beat IBM's own 90MHz ValuePoint Pentium to market, and comes fully stocked and multimedia ready.

Loaded The TP90PCI's $4,032 price might seem steep for a system in this class, but that owes largely to its spacious 17-inch monitor. A more basic desktop configuration comes with 8MB of memory and a 15-inch monitor, and costs a very affordable $2,739.

In either configuration, however, performance was disappointing, and this surprised us. All of the pieces for show-stopping speed are in place: 256K level-2 write-back cache, a video accelerator with 2MB of VRAM, and Western Digital's 540MB Caviar 2540 IDE hard drive running on local bus.

But Ambra's TP90PCI tied with Zeos's Pantera 90 for last place in applications performance tests. Both machines would benefit from a larger level-2 cache and a 64-bit video accelerator. Even so, the TP90PCI is nearly 70 percent faster than Compaq's 66MHz 486DX2-based ProLinea MT 4/66 CDS. It won't leave you drumming your fingers while you wait for a spreadsheet to recalculate.

Dance and Sing The TP90PCI is loaded for multimedia. Philips' dual-speed multisession CD-ROM drive is standard, as is Media Vision's 16-bit, dual-channel Pro Audio Spectrum 16 sound card. Speakers are included, and there's plenty of room for expansion: six drive bays, as well as four ISA slots, two PCI slots, and one PCI/ISA combination slot. On the software side, the TP90PCI includes only the basics: DOS 6.2 and Windows 3.1.

The system RAM is expandable to 128MB, but make sure you buy your machine stocked with as much memory as you plan to use. Adding RAM requires removing the hard drive, and the case is supported by a single plastic cross beam that threatens to break when you remove it. Ambra also offers a 1GB hard-drive option, and the CPU is upgradable. At $2,739 for the basic configuration, it's a good price for a multimedia Pentium, but we'll take the comparably configured $3,195 Pantera 90 from Zeos instead.

Performance: Windows Apps

Tick, Tick, Tick: Despite average performance in carrying out processor- and graphics-intensive tasks, Ambra's TP90PCI tied with Zeos's Pantera 90 for last place when running our suite of Windows business applications.

Not Enough Time To Get Everything Done?

ACE Can Do It For You!

The way your phones are answered, the quality of your faxes and the speed of your data can make your life easier and make a better impression to your customers and clients. And, unlike you, ACE can do it all at once!

ACE is the all-in-one board that provides a voice-mail system, a fax-on-demand system and sends and receives high-speed faxes and data files, even voice and audio WAV files. It's ideal for PC telemarketing, business-to-business phone/fax communications, telecommuting and home office use. Plus, ACE's 16-bit stereo sound capabilities fulfill all your PC's multimedia entertainment needs.

ACE utilizes Mwave Technology from IBM Microelectronics and provides DSP power to upgrade and grow as your needs change.

Suggested list price for ACE Model 5000 is $299

- **FAX** *ACE saves you money by reducing costs of long-distance calls. ACE provides true background faxing that delivers fast, clear and clean faxes to and from your PC. FAX-ON-DEMAND capabilities are built-in!*
- **MODEM** *ACE's high-speed 14,400 bps modem saves you money by reducing costs of on-line services, bulletin boards and long-distance data transfers. Its advanced DSP chip is SOFTWARE UPGRADABLE for more features to come, such as color faxing and high-speed 28,800 bps data communications!*
- **VOICE** *ACE provides a complete voice-message center with voice-mail, remote retrieval of both fax and voice messages, and even Call-Paging. It's upgradable in the future for Caller ID, speaker phone capabilities... and more!*
- **SOUND** *ACE also provides crisp, clear 16-bit stereo sound from the hard drive, telephone and CD. The ACE AUDIO Center allows you to listen, cut, paste and mix MIDI and WAV music and sound files with other files. Perfect for multimedia presentations, even games!*

CALL: 1-800-503-BEST 2378

BEST DATA

ACE is available at: COMPUSA THE COMPUTER SUPERSTORE | COMPUTER City | Fry's ELECTRONICS | SOFTWARE ETC

ACE™ (Advanced Communications Enhancement™) are registered trademarks of Best Data Products, Inc. All other trademarks are the property of their respective holders. © Best Data Products, Inc. All rights reserved

Circle 122 on reader service card.

90MHz Pentium: Axik Ace Power 586-90V/CD

Windows **Ace?**

USABILITY: *Roomy tower case.*
PERFORMANCE: *Squarely middle-of-the-road.*
TECHNOLOGY: *A VESA local-bus holdout.*
VERDICT: *Pricey for its performance and configuration.*

FILEBOX

Ace Power 586-90V/CD

Pros: Superb hard-disk performance, lots of room for expansion.

Cons: For the price, a 17-inch display and sound card should be included.

Suitability: Well-crafted (albeit expensive) Windows machine.

$4,258
Axik Computer
(800) 234-2945, (408) 735-1234
Reader Service No. 676

Don't kiss VL-Bus good-bye just yet. While PCI local bus is quickly taking over the Pentium platform, Axik's Ace Power 586-90V/CD proves that there's plenty of life left in VESA's technology. The $4,258 tower we reviewed held its own against Micron's P90PCI PowerStation and Dell's Dimension XPS P90—both of which use the newer PCI standard.

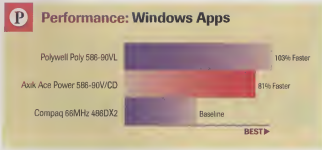
Hedged Bet The engineers at Axik took no chances where performance was concerned. The system comes with a full 512K write-back cache as well as Promise Technology's DC-4030VL local-bus hard-drive caching controller and 4MB of cache for the 540MB Maxtor MXT-540R drive. The Ace Power 586-90V/CD also features the VESA version of the Diamond Viper video accelerator with 2MB VRAM.

The results? Solid midlevel performance that will neither dazzle nor disappoint. It nosed ahead of Micron's P90PCI PowerStation in our Windows applications tests and delivered virtually the same performance as Dell's Dimension XPS P90. On the other hand, drive performance was very hot—nearly as fast as Sirius's SST P5-90VL and Polywell's Poly 586-90VL, both of which also have the advantage of well-stocked caching controllers.

Room to Move The Ace Power 586-90V/CD's tower case provides more than ample upgrade space. There are nine drive bays in all. The CPU is cooled by a heat sink with a fan mounted unobtrusively on top, allowing plenty of room to work when going under the hood. Five ISA and three VESA local bus slots are all within easy reach. Memory is expandable to 128MB using 2MB, 4MB, 8MB, 16MB, 32MB, or 64MB SIMMs, which leaves two of the four sockets free. One gigabyte of storage not enough? No worries. The hard drive is upgradable to 9GB. And like other Pentium systems in this roundup, the CPU is upgradable, too.

We liked the triple-speed CD-ROM drive, which has volume controls and a headphone jack on the front and a SCSI port on the back. There was no sound card in the system we tested, but Axik will throw in a Sound Blaster 16 SCSI-2 with ASP for $200. While they're at it, we wouldn't mind a desktop model of this system configured like our tower unit . . . for the same price.

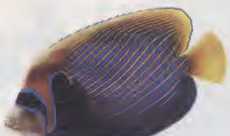
Performance: Windows Apps



Don't Blink: Almost twice as fast as a basic 66MHz 486DX2, the Ace Power 586-90V/CD performed on par with Dell's Dimension XPS P90—thanks to its VESA local-bus caching controller with 4MB of onboard RAM.

Find out why your PC won't talk to your LAN. And what you can do about it.

Shop. But don't drop. Need a 100% cotton pinpoint oxford shirt with button-down collar? In ecru? Try on our Electronic Mall.®



Dive deep into aquarium lore. Like whether a canister or protein filter is better for a 110-gallon salt-water tank.

Price a new Mustang. Or just learn everything about it.

Finally, a computer information service you can't outgrow. No matter how hard you try.

Learn how to monitor military satellites. (They watch us, why shouldn't we watch them?)

Find out just what the heck a zither is.

Talk to twice as many people about parallel universes.

No matter what you're into, you can get more out of CompuServe.

You can range widely over a list of services that will help you, entertain you, teach you, and challenge you. Or delve deeply into your favorite topics, learning (or even teaching) more, meeting experts, and making friends with people who share your interests.

CompuServe lets you do everything from keeping in touch with our communication services, to getting advice from online hardware and software experts. It's the one computer information service you won't outgrow.

But you will have a good time trying.

For a low one-time membership fee of $8.95 a month, you can use our most popular services as often as you like: news, sports, weather, shopping, reference materials, our electronic mail service of up to 60 messages a month, and more. Plus, there's a whole universe of other, extended options available at nominal additional charges. Your first month on CompuServe will be free, and we'll give you a $25 usage credit to explore our extended services.

To buy a CompuServe Membership Kit, see your computer dealer. For more information, or to order direct, call 800 848-8199 (614 457-0802 for international inquiries).

CompuServe®

The information service you won't outgrow.™

Circle 135 on reader service card.

When all else fails

Starting at $139!

There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if a failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problems are as inevitable as death and taxes. That's why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hardware damage.

If you're concerned about lightning, rest assured that when measured using the ANSI/IEEE 587 Category A test wave, Back-UPS are superior to

APC Voted most reliable by 3-to-1

Tripp

Best

PC MAGAZINE

In a recent poll by PC Magazine's MagNet, APC was voted the most reliable UPS manufacturer by a 3-to-1 margin. That's dependability that will see you though years of unmatched power protection.

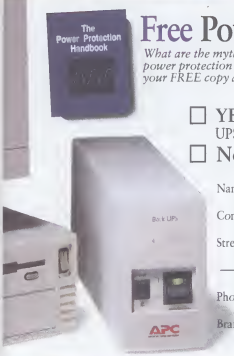
PC MAGAZINE UK EDITORS' CHOICE

"The clear winner in price performance...it's unbeatable..."

August 1993
APC Back UPS 1250

© 1994, APC. Back–UPS, PowerChute are trademarks of APC. Other trademarks are the property of their owners. Specs subject to change without notice.

Back-UPS prevail



Free Power Solutions Handbook

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

☐ **YES!** I'm interested in trading up a competitive or older UPS to a Back-UPS. Please send Trade-UPS info.

☐ **No!** But I would like a FREE Handbook.

Name _____ Title: _____

Company _____

Street/City/State _____

_____

Phone/fax: _____

Brands of UPS used? _____ # servers/PCs to be protected? _____

E7

at Baxter Land
r brands before Back-
ays, a second one
hours, a third lasted
s bought my Back-
ohat I had paid for
ed three more Back-
months they've been
same power line that
ds alive!"

ING FEATURES

power beats
outs

(tested to UL1449)
for maximum

onditioning and EMI/
tches

security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

MADE IN

And since data processed on networked clients needs protection too, the $139 Back-UPS 250 provides an economical solution for all your LAN workstations.

Times Readers Choice awards...

PC World Top 20 Upgrade

Windows Mag Readers' Choice

READERS' CHOICE 1993

Computer Reseller News Editors' Choice

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how afforable it has become is easy...

Call today and find out (the easy way) why more than 1,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

LAN Interface (on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.

Site diagnostics automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician's visit to diagnose.

Option switches allow you to customize transfer voltage and alarm settings.

Test Switch for ongoing peace of mind

2 year warranty and full safety approvals

$25,000 Lifetime Equipment Protection

Back-UPS (R to L)	Application	Sugg. List
250	LAN nodes, internet hardware, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

For Govt/GSA Sales, Call 1-800-788-5414

Microsoft Windows Compatible yes NetWare Tested and Approved

Artisoft LANtastic

SCO

Banyan Vines

Solaris

SunSoft

APC™

AMERICAN POWER CONVERSION

800-800-4APC

Instant fax Info (800)347-FAXX

APC EUROPE (+33) 64625900 / ASIA/PACIFIC FAX: 401-789-1631 / L. AMERICA FAX: 401-789-9771 / Compuserve: GO APCSUPPORT

Circle 116 on reader service card.

Dept. E7

When all else fails,

There are three types of computer

APC Voted most reliable by 3-to-1

Starting a

$139

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone _____

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

APC

AMERICAN POWER CONVERSION

132 Fairgrounds Road
P.O. Box 278
West Kingston, RI 02892-9920

PC MAGAZINE UK EDITORS' CHOICE

August 1993
APC Back UPS 1250

LIFETIME EQUIPMENT PROTECTION

$25,000

© 1994, APC. Back-UPS, PowerChute are trademarks of APC. Other trademarks are the property of their owners. Specs subject to change without notice.

Back-UPS® prevail

"All other brands of UPS die regularly in this lightning prone environment. My APC won't die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie. "With other brands, users don't find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."

Don Traux knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."

Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

virtually all separate surge suppressors. Surge performance is even backed by a $25,000 Lifetime Equipment Protection Guarantee.

If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

MADE IN

And since data processed on networked clients needs protection too, the $139 Back-UPS 250 provides an economical solution for all your LAN workstations.

More than... 1,000,000 Satisfied Users

APC has won more awards for performance and reliability than all other UPS vendors combined...including four consecutive LAN Times *Readers Choice awards...*

PC World Top 20 Upgrade · Windows Mag Readers' Choice · Readers' Choice 1993 · Reseller News Editors' Choice

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how afforable it has become is easy...

Call today and find out (the easy way) why more than 1,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

AWARD-WINNING FEATURES

Instantaneous backup power beats blackouts and brownouts

Unmatched lightning (tested to UL1449) and surge protection for maximum hardware safety

Network-grade line conditioning and EMI/RFI filters prevent glitches

LAN Interface (on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.

Site diagnostics automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician's visit to diagnose.

Option switches allow you to customize transfer voltage and alarm settings.

Test Switch for ongoing peace of mind

2 year warranty and full safety approvals

$25,000 Lifetime Equipment Protection

Back-UPS (R to L)	Application	Sugg. List
250	LAN nodes, internet hardware, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

Microsoft Windows Compatible · yes NetWare Tested and Approved · Artisoft LANtastic · Novell Net Ware · Windows Magazine Readers' Choice · Windows · SCO Unix · Banyan Vines

APC™

AMERICAN POWER CONVERSION

800-800-4APC

Power-fax Info (800)347-FAXX

APC EUROPE (+33) 64625900 / ASIA/PACIFIC FAX: 401-789-1631 / L. AMERICA FAX: 401-789-9771 / Compuserve: GO APCSUPPORT

For Govt/GSA Sales, Call 1-800-788-5414

Circle 116 on reader service card.

Dept. E7

90MHz Pentium: Dell Dimension XPS P90

Rock Solid

USABILITY: *Excellent attention to detail.*
PERFORMANCE: *Respectable, but not the fastest.*
TECHNOLOGY: *Massive 1GB hard drive.*
VERDICT: *A first-rate multimedia business workhorse.*

FILEBOX

Dimension XPS P90

Pros: Winning feature set and design. Dell's support is superb.

Cons: It's fast, but other Pentiums are faster.

Suitability: The ideal multimedia business system for today's and tomorrow's applications.

$4,199
Dell Computer
(800) 613-3355, (512) 338-4400
Reader Service No. 677

Dell's got a surprise for you. Its $4,199 desktop Dimension XPS P90 may seem expensive at first glance, but peek beneath the hood and you'll find a shrewd and feature-laden configuration that's well worth the cost. Let us put it another way: Dell's 90MHz Pentium offers high dollar value.

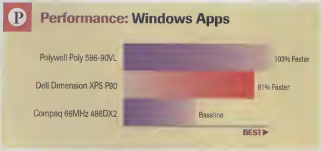
Winning Formula Begin with 16MB of RAM, expandable to 128MB, then add a 1GB Conners IDE hard drive (almost twice the storage space of the other systems tested) running on PCI local bus and a 256K write-back level-2 CPU cache. This machine features a zippy 64-bit Number Nine #9GXE64 Pro video card stocked with 4MB VRAM that also runs on local bus, not to mention Panasonic's CR-563 dual-speed multisession CD-ROM drive, a Sound Blaster 16 sound card, speakers, and a 17-inch monitor.

All this adds up to a serious multimedia business machine, even if its performance isn't as fast as Polywell's Poly 586-90VL. The Dimension XPS P90 tied Axik's Ace Power 586-90V/CD for fourth place in our Windows applications benchmarks, just behind Gateway 2000's P5-90 and more or less on par with Micron's P90PCI PowerStation. A larger level-2 cache would boost performance slightly. However, hard-drive performance was superb, even without a caching controller (the systems from Axik, Polywell, and Sirius all include one).

How You Like 'Em In case it isn't obvious, we like the Dimension XPS P90. Performance is well above average, and the configuration is suited to the Pentium—especially the 1GB of hard-drive real estate. On the software side, PhotoStyler CD, Sound Effects Library, and Multimedia Sound Studio CD come bundled with the machine. They're titles you'd expect from a budget-line PC, but they're worth having.

The Dimension XPS P90 has enough muscle and upgradability for any office. Four ISA slots, two PCI slots, and one ISA/PCI slot provide plenty of room for expansion in the machine's midsized case. When we reviewed it in our July issue (see "Life Begins at 100MHz," page 118), the Dimension XPS P90 was the fastest PC to cross our test bench. It's no longer the fastest, but it's still one of the best.

Performance: Windows Apps



Better Than the Average Bear: It's not the fastest gun in the West, but the Dimension XPS P90's performance ranks above average for a Pentium, even with a small 256K write-back level-2 cache and no caching controller.

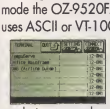
THE NEW WIZARD OZ-9520FX.

(IT WOULD BE EASIER TO TELL YOU WHAT IT DOESN'T DO)

It's the latest addition to the #1 selling line of personal information organizers. It features a pen-based graphical user interface, 512K of

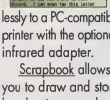
memory and all the tools you could ever want in a 10.5 ounce package. And the new "ultra-compact fax modem" only adds 1.27 ounces and requires no additional cables or setup for use. Best of all, it can remain attached to the Wizard and still fit in a pocket or purse.

The unit's built-in fax software permits users to send a drawing, a letter, or even an entire folder of documents. The software also provides

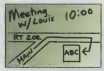


emulation to send and receive electronic mail and connect to on-line services like CompuServe®.

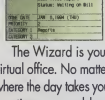
A word processor with cut, paste, and a variety of text styles enables you to produce professional-looking letters. Completed documents can then be beamed to a colleague's Wizard or output wirelessly to a PC-compatible printer with the optional infrared adapter.



Scrapbook allows you to draw and store hand-written words or maps and diagrams directly on the screen using the Wizard's stylus or your finger. Images can also be imported from a PC or Mac® into Scrapbook enabling telephone entries, for example, to have portraits or maps attached to them. A unique Filer system–of graphically represented folders–groups related information together by subject, making it ideal for project management.



And when it comes to time management, Wizard sets the standard. Four different calendar views, 3 phone directories, a To Do list, and there's even a function that allows you to enter annual events, like birthdays and anniversaries, so you'll never miss a moment.



The Wizard is your virtual office. No matter where the day takes you, creating a spreadsheet is as easy as inserting the optional PenCell® spreadsheet card.

Using Computer Link software, data can be transferred to and from a PC or Mac®. And the optional wireless adapter enables Wizard's infrared technology to make this transfer effortless.

And if you ever have any questions there's even a built-in tutorial with explanations and diagrams for every function. But, until you get one, fax us at 1-800-74-SHARP. We'll answer your questions about the OZ-9520FX and tell you about our high-end OZ-9500 and OZ-9600II series. Or call us at 1-800-BE-SHARP and we'll help locate your nearest dealer. It's just about the only thing this Wizard can't do for you.

THE NEW WORKPLACE™

WIZARD® Carried By The Most Organized People On Earth.

SHARP®
FROM SHARP MINDS
COME SHARP PRODUCTS™

LCD

COPIERS • FACSIMILE • LASER PRINTERS • NOTEBOOK COMPUTERS • COLOR SCANNERS • PERSONAL DIGITAL ASSISTANTS • CALCULATORS
CORDLESS TELEPHONES • TYPEWRITERS • WORD PROCESSORS • WIZARD® ORGANIZERS

©1994 Sharp Electronics Corporation. Compuserve® is a registered trademark of CompuServe, Inc. Mac® is a registered trademark of Apple Computers, Inc. PenCell® is a registered trademark of PenWare, Inc. Simulated screen image

90MHz Pentium: Gateway 2000 P5-90

Spry **Giant**

USABILITY: *Acres of room for expansion.*
PERFORMANCE: *Third overall.*
TECHNOLOGY: *The fastest PCI-based machine tested.*
VERDICT: *Lots of supersystem for just under $4,000.*

FILEBOX

Gateway 2000 P5-90

Pros: All the right pieces for big multimedia.

Cons: Massive tower case is likely to be too big for many offices.

Suitability: All-around multimedia bargain with great options and software to boot.

$3,999
Gateway 2000
(800) 846-2000, (605) 232-2000
Reader Service No. 678

Make no mistake: Gateway 2000's $3,999 P5-90 is *big*. A giant tower that slopes gently outward near the floor for greater stability, it absolutely looks like an engine of office power.

Indeed, it is. We'd change very little on its standard configuration, which includes 16MB of RAM (expandable to 128MB), Western Digital's 540MB Enhanced IDE Caviar 2540 hard drive running on PCI local bus (Gateway also offers a 1.2GB option), and a 64-bit Matrox MGA graphics accelerator with 2MB of VRAM running on local bus and capable of 1,280-by-1,024-pixel resolutions. The machine also features NEC's snazzy triple-speed CDR-510 multisession CD-ROM drive, a 16-bit sound card, a pair of Yamaha speakers, a 17-inch monitor, and an enviable software bundle. Did we leave anything out?

Take Charge Perhaps if Gateway had bumped the standard 256K cache to 512K, or added a caching controller, it would have made the P5-90 the performance leader in this roundup. As it is, the system trailed only Polywell's Poly 586-90VL and Sirius's SST P5-90VL, both of which come with well-stocked caching controllers for their IDE drives (each includes 4MB of cache memory). Still, no one can call the P5-90's performance shabby.

At roughly $100 more than the Poly 586-90VL, it performs only slightly slower and comes equipped with a nearly identical feature set. What's the catch? The P5-90 sports a 17-inch CrystalScan monitor (the Poly 586-90VL's monitor is 15 inches)—well worth the extra cost. But why pair multimedia capability and a high-resolution monitor with a box designed for servers? No matter. There are four ISA slots, two PCI slots, and one ISA/PCI slot. And yes, there are eight drive bays, should you need them.

And Software, Too Give Gateway 2000 bonus points for including Windows for Workgroups 3.11, which actually runs faster than vanilla Windows. Microsoft Office Professional is also part of Gateway 2000's latest bundle, and the company's three-year warranty and toll-free support are part of the bargain. The P5-90 is clearly a winner—if you can find a space big enough to stash the monster.

Performance: Windows Apps

Fly PCI: Gateway 2000's P5-90 ranked third overall in Windows applications benchmarks—a bigger level-2 cache and a caching controller might have pushed it ahead of the leaders. Never mind. You won't be disappointed.

Millions of people already have.

We're Mitsumi. We're one of the world's leading suppliers of PC peripherals. Keyboards, mice, floppy disc drives and CD-ROM drives†. So we're used to being used.

Case in point: our new double-speed CD-ROM drive has the highest reliability rating in the industry. Buy one today and you can be assured that you'll get optimum performance and longevity. And each of our three keyboard models is guaranteed to withstand more than 10 million keystrokes. So you can pound out literally millions of documents without missing a beat.

Mice? Floppy disk drives? Just as tough.

Price is another Mitsumi advantage that millions of computer users have experienced. Because high volume production is our specialty, we're able to offer world-class peripherals at prices that help keep your bottom line—in line.

So share what millions of Mitsumi customers have already done.

Drag Us. Punch Us. Drive Us. Call Us.

NEW FROM MITSUMI

The New Mitsumi Wireless Printer Sharing Kit.

For remote networking with no cards or cables. Connects up to sixteen PCs to any one of four individual printers. Easily attaches to parallel port.

1-800-MITSUMI (1-800-648-7864)
For more information and literature.

MITSUMI

†Mitsumi CD-ROM Drives are MPC Compliant. Supports KODAK PhotoCD and all international standards. ©1994 Mitsumi Electronics. All rights reserved.

MICE **KEYBOARDS** **FLOPPY DISK DRIVES** **CD-ROM DRIVES**

90MHz Pentium: Micron P90PCI PowerStation

Sweet **Bargain**

USABILITY: *Easy-off case design makes upgrades a snap.*
PERFORMANCE: *About average for a machine in this class.*
TECHNOLOGY: *Speedy 64-bit graphics.*
VERDICT: *Would that it were a little faster.*

FILEBOX

P90PCI PowerStation

Pros: Outfitted to the nines for the most demanding business applications.

Cons: Only average performance.

Suitability: The business upgrade to get when the purse strings are tight.

$3,999
Micron Computer
(800) 515-9197, (208) 465-3434
Reader Service No. 679

Should you ever do a double take on an ad for a 90MHz Pentium system priced at an eye-popping $2,999, it might very well be Micron's. The company has forged its reputation on high-performance systems that undercut even the lowest budget beaters. The $3,999 P90PCI PowerStation we tested came fully dressed for business, yet costs well below virtually all of the other machines in this roundup.

Chutzpah Like the Pantera 90 from Zeos, the P90PCI PowerStation's performance soared in *PC Computing*'s Winbench component-level tests and turned in only mediocre results in Windows applications benchmarks, which more realistically reflect the performance you can expect. On these latter tests, it performed on par with Dell's Dimension XPS P90 and Axik's Ace Power 586-90V/CD, besting the Pantera 90 and Ambra's TP90PCI.

Outfitted with a 256K write-back cache, 16MB RAM (expandable to 192MB!), Conners' 540MB CFA540 IDE hard drive, and Matrox's excellent 64-bit MGA card with 2MB of VRAM, the PowerStation comes with all the iron of machines that sell for $1,500 more. There was no sound card on the unit we received, but you'll find Mitsumi's dual-speed multisession CD-ROM drive and a 17-inch monitor.

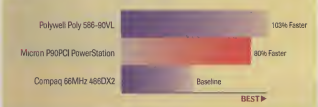
Easy Off A single oversized finger screw on the back of the desktop case releases it from the chassis—a design that makes going under the hood a snap. Slip off the case, and inside you'll find eight slots, three of which are for PCI peripherals.

The CPU uses a heat sink and its own fan, as well as the fan from the power supply. But like all the systems in our roundup, overheating is no longer a problem thanks to the 3.3-volt version of the Pentium (see "Too Hot to Handle?" page 179).

Micron's software bundle for the PowerStation is impressive. Along with Windows for Workgroups 3.11, it comes with Microsoft Office 4.2. Toll-free support and a one-year warranty are also standard.

When you're making the case for a 90MHz Pentium, first show your office manager all of the features that come with the P90PCI PowerStation. If he or she says no, mention the price. That should cinch it.

Performance: Windows Apps



Giddyap: You won't call it slow, even though performance under Windows applications could be better for a 90MHz Pentium. We recommend the optional 512K CPU cache and SCSI caching controller for an extra performance boost.

Your roommate helped you with your term paper.

Uncle Seymour got you your first job.

Why not get some real advice on your next presentation?

Introducing Harvard Graphics 3.0.

Want some advice from an expert to make your presentations more effective? There's one inside every box of new Harvard Graphics 3.0. With this new version, Harvard Graphics takes its most popular feature—the Advisor—and carries it forward a quantum leap. The new Advisor System puts thousands of hours of presentation savvy to work for you, automatically. Suddenly, the guesswork and gruntwork of putting together a presentation are ancient history. You get Design Tips to help you choose the right colors and layouts. Quick Advice to tell you what kind of chart will best dramatize your data. And the Design Checker to review and improve on your whole presentation, just like a spellchecker. Want to make it really easy on yourself? Just use one of the enclosed Quick Presentations—a collection of polished presentations you can instantly customize for your own use. But all this is just scratching the surface. New Harvard Graphics 3.0 contains all kinds of new features. And it works with all your other Windows applications. Upgrading is a no-brainer. So, go ahead, just pick up the phone.

Upgrade For Only $99.*
Want more information? Call 1-800-336-8360, x 375.

SPC SOFTWARE PUBLISHING

* Upgrade eligibility requires that you own a licensed copy of Harvard Graphics or competitive presentation software. Other conditions apply; call for details. Harvard Graphics and the Software Publishing Corporation logo are registered trademarks of Software Publishing Corporation. Harvard Graphics is a product of Software Publishing Corporation and has no connection with Harvard University. SPC acknowledges all trademarks and the rights of trademarks referred herein. © 1994 Software Publishing Corporation. All rights reserved.

90MHz Pentium: Polywell Poly 586-90VL

Barn **Burner**

USABILITY: *Lots of expansion—and then some.*
PERFORMANCE: *Wow!*
TECHNOLOGY: *Snappy VESA local-bus disk and video.*
VERDICT: *Our favorite. The fastest 90MHz Pentium we tested.*

FILEBOX

Poly 586-90VL

Pros: It's fast—mighty fast—when running Windows applications.

Cons: Skip the 15-inch monitor and spring for a 17-incher instead.

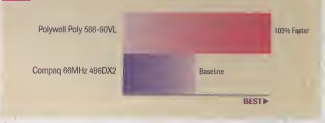
Suitability: Spurs Windows application performance like no other Pentium system.

$3,900
Polywell Computers
(800) 999-1278, (415) 583-7222
Reader Service No. 680

Think PCI owns Pentiums? Think again. Polywell Computers' Poly 586-90VL—a VESA machine—screamed past every PCI Pentium in our roundup when running Windows applications. And not just by a small margin, we might add; it's the fastest 90MHz Pentium we've seen to date.

Stoked VL-Bus isn't the only unusual feature on this $3,900 Polywell system. For example, the unit we tested came with an IDE caching controller running on local bus with 4MB of RAM. On the other hand, the video card, a 64-bit Orchid Kelvin 64-VLB, comes with only 1MB of slow DRAM, not dual-ported VRAM. All of the other systems we tested came with 2MB or more of speedy VRAM.

Performance: Windows Apps



Smokin': Polywell's Poly 586-90VL was 103 percent faster than Compaq's 66MHz ProLinea MT 4/66 486DX2 when running popular Windows business applications—and easily outran every other Pentium we tested. Need we say more?

Slow video usually hamstrings system performance far more than slow disk transfers. Sure enough, in our Winbench test (which measures raw Windows muscle), the Poly 586-90VL turned out to be the slowest of the 90MHz Pentiums we tested. But hand it a slew of business applications and stand back. No doubt the machine's 512K write-back level-2 cache helps somewhat, as do fast disk accesses on Western Digital's 540MB Caviar 2540 hard drive. Still, its performance in applications tests should give pause to those who believe that PCI local bus owns the future of Pentium.

Stocked The Poly 586-90VL comes with a Media-Magic 16 sound card and a dual-speed multisession CD-ROM drive (which, to our disappointment, uses a proprietary rather than a SCSI interface). There are five ISA and three VL slots, but the hard-drive controller, CD adapter, sound card, video, and even I/O take up slots. Of the eight, you're left with one VL and three ISA slots. But there's plenty of room for extra drives (up to 9GB worth) in the squat, handsome mini-tower. In addition to Windows 3.11 and MS-DOS 6.2, Micron throws in an eclectic handful of CD multimedia titles with its system, including Robocop 3D.

We'd happily pay a bit more for a 17-inch monitor (the price of our unit includes only a 15-inch model), and we'd like to see Polywell move the communications ports to the motherboard in future versions of the machine. Still, for spurring the applications you use today, this is the machine to get.

INTRODUCING REMOTE EVERYTHING: NEW CARBON COPY 2.5

It can happen anywhere: at home, in your hotel room, an airport lounge, while you're overseas. Suddenly you've got to get at a file, access e-mail—maybe even run a program—that's in the PC back at your office.

Now there's a total remote-communications package that lets you do it all, faster than ever. Microcom's new Carbon Copy™ 2.5 offers you easy access and complete control of the files, applications and peripherals of another PC or LAN, no matter where you are.

With its new software gateway you can dial into a single LAN modem and access any PC on the network (ideal for small offices). A built-in terminal emulator allows direct access to on-line services like CompuServe®, and electronic bulletin board systems (BBSs). And Carbon Copy 2.5 supports leading file transfer protocols—no need for additional communications software.

A true Windows application, Carbon Copy 2.5 runs effortlessly, right out of the box. With simple point-and-click, drag-and-drop control; and on-line help. What's more, you can now send and retrieve files between PCs, whether or not Carbon Copy is on the host PC.

New Carbon Copy 2.5: when it comes to fast, easy remote access, we've thought of everything. For free information and the name of your local Microcom dealer, phone

1-800-822-8224

All-In-One Remote Communications

- Integrated Terminal Emulator
- Remote Control
- File Transfer
- Software Gateway
- Remote Clipboard

Also check out Microcom's 28.8 DeskPorte™ *FAST* and TravelPorte™ *FAST* high-speed modems.

Upgrade to Carbon Copy 2.5 for only $49

Now for a limited time, upgrade to Carbon Copy 2.5 from any competitive remote communications software, or any version of Carbon Copy, for only $49. Call today: 1-800-765-1750.

microcom®

The brightest ideas in remote access.

Microcom, Inc., USA (617) 551-1000 • Microcom U.K. Limited, (44) 483-740763
Microcom E.M.A., France (33) 1 46 62 68 68 • Microcom Singapore, (65) 295-2061
Microcom Australia, (61) 2 410-9953

Microcom is a registered trademark and Carbon Copy, DeskPorte and TravelPorte are trademarks of Microcom Systems, Inc. All other trademarks are the property of their respective trademark holders.

Circle 136 on reader service card.

A PENTIUM MACHINE SO ADVANCED, IT EVEN REDUCES THE DRAG ON YOUR WALLET.

This could be one of those rare occasions when what you want coincides with what you can afford. You want speed. You want a good price.

That's the whole idea behind our new, expanded Bravo line. These machines are designed, engineered and tested with the same exacting level of attention that goes into every single AST computer.

Our new Bravo MT mini-tower features Intel's incredibly fast Pentium™ 60MHz microprocessor. It's all the power you need to run an entire workgroup or the latest graphics-intensive programs.

There's more that's new, too. Our entire Bravo LC family, while still affordable, has new muscle: Intel 486 microprocessors up to 100MHz and a VESA local bus slot. So the LC is fast today, and can grow right along with your business needs. It's even upgradable.

BRAVO LC *Intel DX4/100,486DX2/66, 486SX2/50, 486SX/33, 4 ISA slots including 1VL slot, 5 drive bays, Pentium OverDrive upgradable.* **BRAVO LP** *Intel 486DX2/66, 486SX2/50, 486SX/33, 2 ISA slots, 3 drive bays, Pentium OverDrive upgradable.*

*©1994 AST Research, Inc. All rights reserved. AST, AST Computer, AST logo are registered trademarks of AST Research, Inc. The Intel Inside logo is a registered trademark, and Pentium and Pentium OverDrive are on-site and two-year carry-in warranty for hard-drive models. Three-year carry-in warranty for non-hard drive models. **CY93 unit volume shipments of AST and AST manufactured brands (International Data Corp.*

BRAVO MT *Intel Pentium 60MHz, 486DX2/66, 486SX2/50, 486SX/33, 6 ISA slots, 6 drive bays, FlashBIOS. Pentium 60MHz includes 5 ISA and 2 VL slots.*

to Intel's Pentium OverDrive™ processor.

How about more performance in less space? The Bravo LP is a low profile 486, full of award-winning engineering. For instance, innovative security features help you keep your confidential work to yourself. While the V-RAM is expandable to 2MB for 64-bit processing.

Our 486 Bravos are all EPA Energy Star approved. So you can save energy, money, and perhaps even a few trees. A three-year warranty,* along with the most responsive around-the-clock phone support anywhere provide backup. But then, would you expect anything less from the world's fifth largest manufacturer of personal computers?**

3 YEAR WARRANTY

intel inside

Oh, yes. You wanted a good price. We already agreed to that right up front. For an AST reseller near you, please call 800-876-4AST.

AST® COMPUTER

*rademarks of Intel Corporation. All other trademarks are the property of their respective owners. *One-year

90MHz Pentium: Sirius SST P5-90VL

High Flyer

USABILITY: *Compact minitower case.*
PERFORMANCE: *Second only to the Poly 586-90VL.*
TECHNOLOGY: *Another VL-Bus holdout.*
VERDICT: *Stacks up admirably against other Pentiums.*

FILEBOX

SST P5-90VL

Pros: Price includes a 17-inch monitor and blistering performance.

Cons: Graphics performance couldn't match the Poly 586-90VL.

Suitability: A close competitor to our top pick, Polywell's Poly 586-90VL.

$4,200
Sirius Systems Technology
(800) 424-0724, (713) 946-0724
Reader Service No. 681

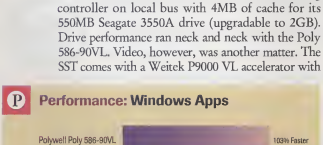
Not only was the fastest system we tested, Polywell's Poly 586-90VL, based on VL-Bus, so was the second fastest, Sirius Systems Technology's $4,200 SST P5-90VL. In many ways, the two systems are remarkably similar. As we discovered with SST's system, however, the devil is in the details.

Sweet Spot Like the Poly 586-90VL, the SST P5-90VL uses an Opti chipset and comes with 512K of write-back level-2 cache. It also uses an IDE caching controller on local bus with 4MB of cache for its 550MB Seagate 3550A drive (upgradable to 2GB). Drive performance ran neck and neck with the Poly 586-90VL. Video, however, was another matter. The SST comes with a Weitek P9000 VL accelerator with 2MB of VRAM. Despite the machine's stunning overall performance when compared with the other systems in our roundup, video performance couldn't keep up with that of Polywell's Pentium.

Unique to the SST P5-90VL is its liquid cooling system for the CPU. Flourinert, a liquid with a very low boiling point, circulates through a plastic case that sits on top of the chip. The CPU heats the liquid to boiling, which opens a valve through which the Flourinert passes to a condenser located away from the CPU. It cools, returning to liquid form, then trickles back to the CPU. As crafty as this sounds, the model we tested with liquid cooling actually ran an average of 15 percent hotter than the other systems in this roundup. Sirius also sells a unit with a CPU fan, which we recommend instead; the fan-cooled unit we tested ran cooler than the liquid-cooled model.

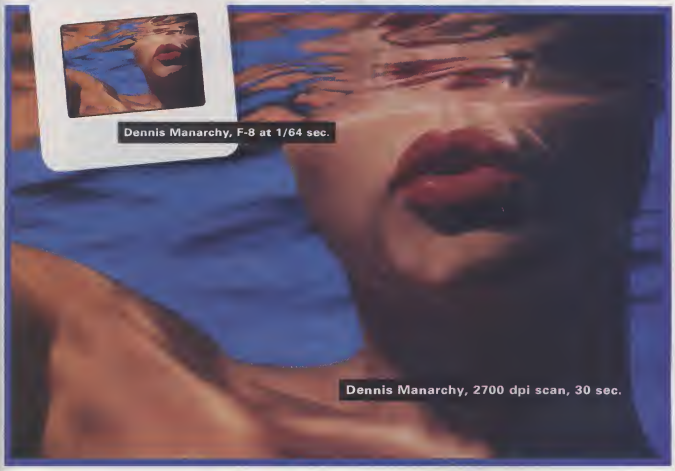
Toe-to-Toe Given the machine's blazing performance and rich feature set—which includes a dual-speed CD-ROM drive, five ISA and three VESA local-bus slots, and a 17-inch monitor—the SST lines up pretty evenly with the Poly. The model we tested didn't include a sound card, though Sirius will sell you either a 16-bit Media Vision Pro Audio Spectrum 16 or Sound Blaster 16 for a mere $100 extra.

Which system would we choose? We like the SST P5-90VL's 17-inch monitor. But in the end, we'll take Polywell's Poly 586-90VL for its performance edge and smaller price tag.



Greased Lightning: Performance on the SST P5-90VL lagged slightly behind Polywell's Poly 586-90VL, its near-twin. Both machines sweep the lot, thanks to well-stocked hard-drive caching controllers and fast VL-Bus video.

The only thing missing is the wait.



New SprintScan 35 Slide Scanner from Polaroid — Brilliant Scans in Under a Minute.

Think of how much more high-quality scanning you'll be able to do at your desk. Or how fast you'll respond to high-volume or last-minute projects. Or even how soon you'll get home.

At under a minute per scan, the SprintScan™ 35 is 5 to 15 times faster than other tested slide scanners, with no loss of quality.* Scanning at resolutions up to 2700 dpi, it samples 10 bits per color (RGB) to deliver the best 24 bits. Which gives you a broader range of colors and better shadow detail. And at only $2,495,† SprintScan 35 won't change the color balance on your bottom line.

Just drop in the slide (positive or negative), point and click. It's that easy. Automatic real-time color processing and image sharpening reduce the need for lengthy post-processing. And it's compatible with both Macintosh and Windows.

The SprintScan 35 Slide Scanner — part of an exciting new line-up of electronic imaging systems from Polaroid.

SprintScan 35 scans slides at 2700 dpi in under a minute.

Don't waste another minute!
For more information call today,
1-800-816-2611 ext. 966.

Polaroid.

* Source: Evaluations by Rich and Associates, June 1994. † Suggested list price. Actual purchase price may vary. "Polaroid" and "SprintScan" are trademarks of Polaroid Corporation.

Circle 204 on reader service card.

AT PRICES LIKE TH
A COMPAQ OR YOU

Compaq Concerto

Now save several hundred dollars on the Compaq Concerto,™ quite simply one of the best notebook bargains around. The Concerto pairs the power of a 486 desktop with the convenience and portability of a quality notebook.

Now Only
$1,299
*Or $47 per month**

Concerto Features:

25MHz 486SL (DX) (33MHz available), 4MB RAM (upgradable to 20MB)
◆
120MB Hard Drive (250MB available)
◆
3.5" Diskette Drive
◆
9.5" Monochrome Backlit VGA Display
◆
Convenient Pointing Device
◆
Local Bus Graphics
◆
2 PCMCIA Type II slots (or single Type III)
◆
Preinstalled MS-DOS® 6, MS-Windows,™ PenPower for MS-Excel, InkWare NoteTaker, and TabWorks®

Compaq Contura Aero

Weighing in at a mere 3.5 lbs., the Contura® Aero™ is the perfect traveling companion. Though lightweight, it's packed with features, including a 486 processor that can run a range of applications with ease, as well as an integrated Compaq trackball that allows for comfortable use on the road.

$999
*Or $36 per month**

Aero Features:

Only 3.5 lbs. and 7.5" x 10.25" x 1.5"
◆
25MHz 486SX, 4MB RAM (upgradable to 12MB)
◆
84MB Hard Drive (170MB available)
◆
8" Monochrome Backlit VGA Display
◆
Integrated Compaq EasyPoint™ Trackball
◆
PCMCIA Type II slot
◆
NiMH Battery & AC Adapter
◆
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks

Compaq Contura

Monochrome	*Color*
$1,799	**$2,099**
*Or $65 per month**	*Or $75 per month**

An affordable notebook with the power and expandability for demanding business applications, and support for communications options. Power management features extend battery life, and security features protect data.

Contura® Features:

25MHz 486SL (DX), 4MB RAM (upgradable to 20MB)
◆
120MB Hard Drive (209MB available)
◆
3.5" Diskette Drive
◆
9.5" Monochrome VGA or 9.5" Color Advanced Passive VGA Display
◆
Compaq Trackball
◆
Battery & AC Adapter
◆
Only 6.2 lbs.
◆
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks

intel inside

*Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. †Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. Compaq Contura Aero and Concerto are covered by a 3-Year Pick-Up Warranty. © 1994 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. Contura is a registered trademark; DirectPlus is a registered service mark, Concerto, ProLinea, Aero, EasyPoint and EasyAccess are trademarks; and Solution Pack is a service mark of Compaq Computer Corporation. Prices, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. TabWorks is a registered trademark of Access Corporation. The Intel Inside Logo is a registered trademark and Pentium is a trademark of Intel Corporation. Offer available in the U.S. only.

The Compaq 3-Year Warranty†

ESE, YOU CAN BUY
CAN COMPROMISE.

Compaq ProLinea MT

MT 4/33s $1,725 *Or $62 per month**

MT 4/66 $2,299 *Or $82 per month**

Minitower case with EasyAccess™ side panel has five expansion slots and five drive bays for superior expandability. Just add options like a fax modem, tape drive, or CD-ROM drive. Upgradable to Pentium™ technology.

ProLinea™ MT Features:

33MHz 486SX or 66MHz 486DX2 (upgradable to Pentium technology, ZIF socket)
◆
4MB RAM (upgradable to 64MB)
◆
340MB Hard Drive
◆
3.5" Diskette Drive
◆
Local Bus Graphics with 1MB
◆
14" SVGA Color Monitor (1024 x 768)
◆
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks

Preinstalled Multimedia Solution Paq available.

Compaq ProLinea 4/33S

Enhanced performance with greater affordability. $1,475 *Or $53 per month**

Multimedia Solution Paq™
With SoundBlaster 16-bit sound board, internal dual-speed CD-ROM drive, external stereo speakers, microphone & multimedia software. Starts at $499.

ProLinea 4/33S Features:

33MHz 486SX (upgradable to Pentium Overdrive)
◆
4MB RAM (upgradable to 100MB)
◆
200MB Hard Drive
◆
3.5" Diskette Drive
◆
Local Bus Graphics with 1MB
◆
14" SVGA Color Monitor (1024 x 768)
◆
Preinstalled MS-DOS 6, MS-Windows 3.1, and TabWorks.

Preinstalled Multimedia Solution Paq available.

Compaq ProLinea Net1/25s

An ideal choice if you're looking for excellent performance at an affordable price. $1,249 *Or $45 per month**

The all-in-one styling saves desktop space and makes setup as simple as plugging the unit in. TabWorks, a Compaq exclusive, is preinstalled for greater ease of use. Network-ready and ideal for peer-to-peer communications.

ProLinea Net1/25s Features:

25MHz 486SX (upgradable to 486DX2/66)
◆
4MB RAM (upgradable to 20MB)
◆
100MB Hard Drive (200MB available)
◆
3.5" Diskette Drive
◆
Built-in 14" SVGA Color Monitor (1024 x 768)
◆
Integrated Ethernet controller (Token Ring available)
◆
Energy Star Compliant
◆
Preinstalled MS-DOS 6, choice of MS-Windows 3.1 or MS-WFW 3.11

COMPAQ DirectPlus

The Compaq DirectPlus Catalog

1-800-888-6038

Weekdays 7-7, Sat. 10-4 CST

Ask for our new free catalog.

Circle 197 on reader service card.

90MHz Pentium: Zeos Pantera 90

Sly Server

USABILITY: *Monster-sized tower case.*
PERFORMANCE: *Brought up the rear running Windows.*
TECHNOLOGY: *Fast video, slow disk.*
VERDICT: *Great bargain—too bad it isn't faster.*

FILEBOX

Pantera 90

Pros: Eye-popping price, excellent expandability, and great applications.

Cons: Sluggish IDE hard-drive performance slows Windows applications.

Suitability: Add a well-cached SCSI drive array, and the Pantera 90 makes a great server.

$3,195
Zeos Int'l
(800) 554-5218, (612) 362-1234
Reader Service No. 682

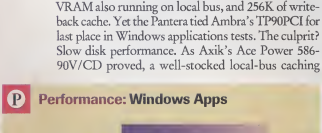
What happened with Zeos's amazing Pantera 90? One glance at the machine's Winbench hardware scores and we expected it to dust every other system in our roundup. But when we put it to work on Windows business applications, it pulled up the rear.

Flip-Flop All of the pieces for top-deck performance are in place: a 528MB IDE Seagate ST3655A hard drive (upgradable to 2GB) running on PCI local bus, a Diamond Viper graphics card with 2MB of VRAM also running on local bus, and 256K of write-back cache. Yet the Pantera tied Ambra's TP90PCI for last place in Windows applications tests. The culprit? Slow disk performance. As Axik's Ace Power 586-90V/CD proved, a well-stocked local-bus caching controller is no panacea. The Pantera 90's drive performance could use a boost.

It bears mentioning that after testing the Pantera 90, we learned that future versions of the system will include Seagate's faster 528MB ST3660A hard drive and Diamond's brawnier 64-bit Stealth 64 graphics card. This combination could well bring the Pantera 90's performance up to par.

Still, the Pantera 90's sluggish performance seems a trifle when you consider its price: $3,195 fully outfitted. That includes the same dual-speed CD-ROM drive used by Sirius's SST P5-90VL and Micron's P90PCI PowerStation. There was no sound card in our system, and the monitor is only a 15-inch display, but let's not protest. The Pantera costs $1,477 less than Ambra's TP90PCI and performs far better. And for a little more than half the difference, you can buy a 17-inch monitor and sound card of your own choosing.

Tower of Power Use the Pantera 90 as the server it was meant to be. Its giant tower comes with ten—count 'em, *ten*—drive bays. There are five ISA and three PCI slots. Besides Windows for Workgroups 3.11, you have your choice of one Lotus application: 1-2-3 for Windows, Ami Pro, Freelance Graphics, Improv, Approach, or Organizer. Take a tip: Swap the IDE hard drive for a well-cached SCSI drive array, bump the CPU cache up to the optional 512K, and let your network fly. Meanwhile, we can't wait for a more compact desktop model.



Pentium Prowler: The Pantera 90's performance on Windows applications tests was disappointing for a 90MHz Pentium, owing to slow IDE drive performance. Future models should include a faster graphics card and hard disk.

The **Smartest** Upgrade

Strange as it may sound, the 90MHz Pentium is likely to be one of the cheapest upgrade paths you'll find. It brings enough muscle to the show to ensure that tomorrow's 32-bit operating systems will hum along unfettered. This means you won't be shopping for yet another system two years from now. It costs less than the 100MHz Pentium, which currently commands a premium as Intel's performance leader. And besieged by competing chips, its price has been slashed deeper—and faster—than any Intel CPU since the PC was invented. Our tests answered these questions as well:

Why upgrade to a Pentium system instead of a 100MHz DX4? Shop around. We think you'll soon find the price difference between the two chips negligible. The power difference, however, is not. Likewise, 60MHz and 66MHz Pentiums are priced in the same ballpark as DX4s. Regardless of the fortunes of 32-bit software such as Chicago and Windows NT, operating systems and applications are already demanding more horsepower than ever. The DX4 will run out of gas far sooner than the Pentium.

What are the key issues for fast Pentium performance? As our tests prove, a fast hard-drive subsystem is key to fast Windows applications performance. The systems that performed best came with caching controllers. Fast video is also important; look for a 64-bit local-bus graphics accelerator.

As for which flavor of local bus to get, PCI is the most common: Five of the systems we tested use it, while three rely on the older VL-Bus standard. Even so, the two fastest systems, the Poly 586-90VL and the SST P5-90VL, rely on VL-Bus.

Is overheating a concern? Decidedly not. Thanks to the 90MHz Pentium's low-energy, low-heat 3.3-volt design, it runs cooler than 66MHz clock-doubled CPUs like Intel's 486DX2.

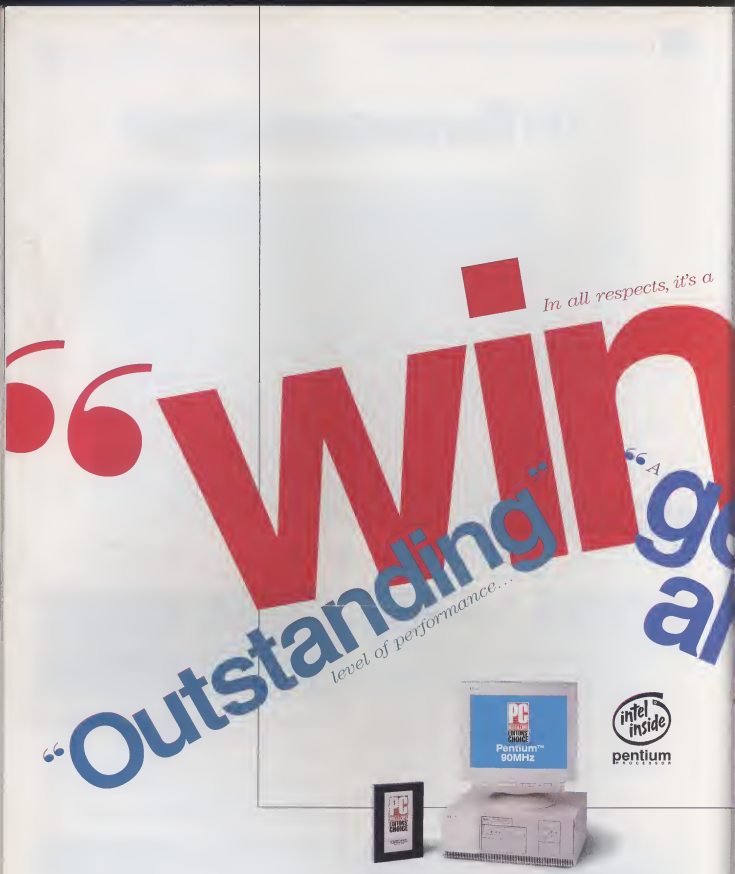
What about the PowerPC? Splendid chip that it is, the PowerPC runs today's Windows applications at about half the speed of a 90MHz Pentium. Will your favorite software vendors eventually port their applications to the PowerPC? Probably, but it's anyone's guess as to when. That's a very risky gamble.

DECISION MAKER

BUY THE BEST **90MHz PENTIUM** FOR YOUR BUSINESS

1 Choose the factor most important to you. **2** Choose the next most important factor. **3** What else is important? **4** For your needs, the best product to buy is . . .

1	2	3	4
Price	Performance	Mechanical Design	Micron P90PCI
		Service & Support	Polywell Poly 586-90VL
	Service & Support	Mechanical Design	Micron P90PCI
		Performance	Polywell Poly 586-90VL
Performance	Price	Bundled Software	Gateway 2000 P5-90
		Service & Support	Polywell Poly 586-90VL
	Mechanical Design	Service & Support	Sirius SST P5-90VL
		Bundled Software	Gateway 2000 P5-90
Service & Support	Price	Mechanical Design	Polywell Poly 586-90VL
		Performance	Polywell Poly 586-90VL
	Performance	Mechanical Design	Polywell Poly 586-90VL
		Price	Polywell Poly 586-90VL


In all respects, it's a
"win
"Outstanding"
level of performance...
"A
ga
al

On June 28th, PC Magazine announced its Editors' Choice Awards. We'd like to thank them for making the HP Vectra XU PC a winner, and for doing an excellent job of writing this ad. For additional reading materials, call us today at 1-800-322-HPPC, Ext.8518.

Intel and the Intel logo are registered trademarks and Pentium and the Pentium Processor logo are trademarks of Intel Corporation. © 1994 Hewlett-Packard Company PP5406

"The HP Vectra XU PC is a power user's dream"

her"

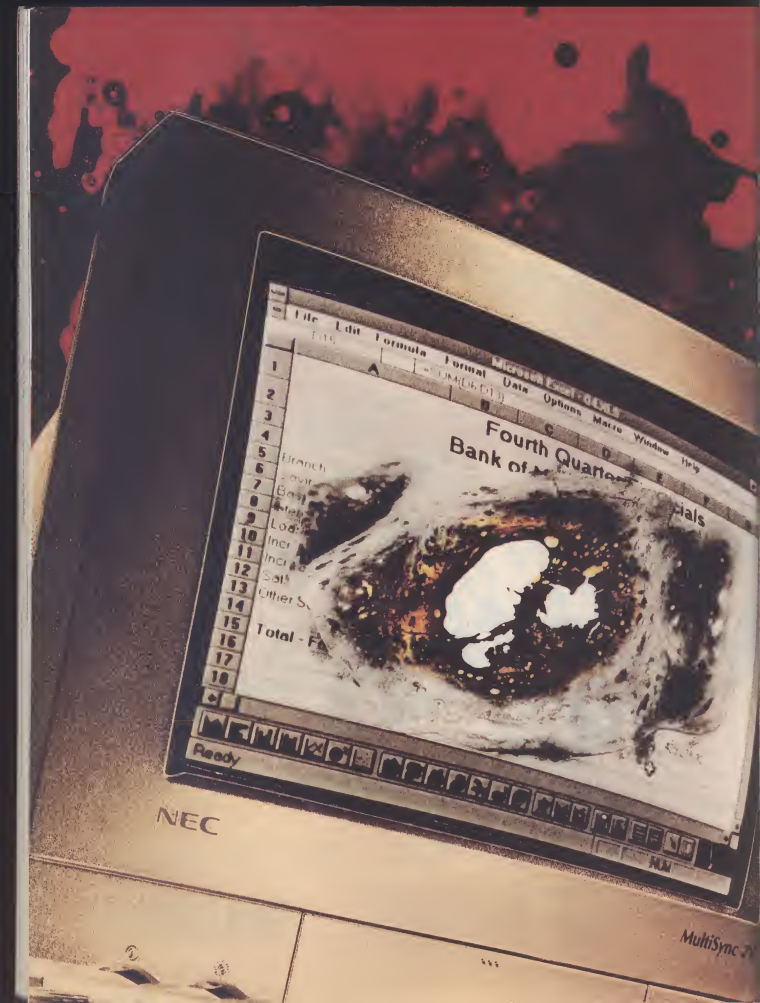
"most advanced design of any system..."

eneration

head of the pack"

Believe everything you read.

HEWLETT® PACKARD


File Edit Formula Format Data Options Macro Window Help
Fourth Quarter
Bank of
Total -
Ready
NUM
NEC
MultiSync

Virus, They Wrote

They lurk in the dark alleys off the Infobahn, these perps who live to hit and run. They do their dirty work, jump the curb, and disappear from the scene of the digital grime. They're virogens, the writers of perverted little programs that seduce data and corrupt programs on your computer. In many ways these virogens are as remorseless as the evil software they create, with no compassion for their victims, whether human or hardware.

Like a jack-in-the-box, the virus writer will hide in the dark and wait until someone turns the handle. Then pop!, there he is, a harlequin with an evil grin, unexpected, unwelcome, unforgiving, vomiting bits of code and staining everything in sight. An ugly picture.

These technotaggers are your worst enemies. They're random beyond reason. They don't care how much cache you have on you. They don't hear when your processor screams.

They don't twitch if your company's financial data rots just because you recalculated some spreadsheets at home one night, and it turned out that your kid had just played some games from a friend's disk on your PC. The virus slinked from your home PC hard disk back to the hard disk on your PC at work. And suddenly it's over the network and you're over at the unemployment office.

Virogens don't need passports because they don't respect borders. They don't use names, just aliases—monikers like Dark Avenger. The Unforgiven. Hellraiser.

If you want to find them, a few simple queries on a handful of bulletin boards can smoke them out. They love publicity. They communicate via anonymous Internet messages with bizarre routing addresses. They call over untraceable phone lines. They're careful not to leave tracks, because they are pursued by their own personal sleuths—virus researchers and security specialists from around the world.

They're part of a weird little symbiotic world full of intrigue, where even the good guys use online aliases. The virus researchers think the antivirus software developers inspire the virogens with financial rewards. The software developers accuse the researchers of building viruses on the side. The virogens suck up the resulting fame and infamy like oxygen.

It's hard to separate truth from innuendo. Who are these virogens? And why would they intentionally murder an innocent passerbyte?

It may sound like a video game, but the war between the virogens and the passerbytes is as real as the job you could lose.

PHOTOGRAPH BY AMY GUIP

BY COREY SANDLER

The Criminals: Baudfellas

"If someone gets a virus, it's their own f---ing fault," growls The Unforgiven from Sweden.

The 19-year-old virogen called one Saturday night on somebody else's krona, certainly not his own. With him on the weak telephone link was his 18-year-old pal Metal Militia. The line cracked like knuckles, but the voices were those of teenagers at a loss for weekend entertainment. Their outlook is simple: They're not responsible for what happens when, for fun, they create a virus that takes up residence in a computer's memory and gloms onto every disk that comes near as easy as drive $A_:$, $B_:$, $C_:$. (See "How Viruses Get into Your System," page 213.)

'The American government can stop me . . . but they can't stop my virus,' boasts the Bulgarian known only as Dark Avenger.

If you're looking for the bad guys, insists Metal Militia, they're the users. "If they don't back up, it's their own fault. They're the ones using pirated software. They're the ones not using antivirus programs."

The boys from Sweden are part of a busy group of college students that has written more than 30 viruses. They publish them in a newsletter aptly called *Insane Reality.* They take a detached, bloodless view of their antics. "We don't harm people. We harm data," The Unforgiven says sharply, to which his partner adds coldly, "We're not affecting people's lives." Hey, they're not throwing bombs—they're just building them. In their eyes, there's a difference.

Are these two antisocial baudfellas typical technotaggers? Even the folks who track virogens can't be sure. Security specialist Pam Kane, president of Panda Systems in Wilmington, Delaware, says, "I don't think there is ever going to be a virus-writer profile, like there is for the airline hijacker." As with any other tagger, by the time their work is discovered they're long gone. Staying invisible at the end of an untraceable phone line, they prevent the authorities from building accurate psychological sketches.

Maybe. But stitch together a picture of young, disaffected rebels, vicious and without remorse, describe them to a Harvard headshrinker, and you get a different opinion. Professor W. Lawrence Hartmann, a psychiatrist specializing in adolescent behavior, diagnoses the virogens thus: "It sounds like an adolescent joy in a newfound kind of potency. Writing a virus gives the author a sense of power and an exaggeration of one's own presence, like writing graffiti on a much larger scale."

And once past adolescence, the virogens seem to be infected by what passes for maturity. One Chicago-area virus writer, no older than 25, has already checked out of the virus-writing game. Going by the name Nowhere Man, he got into it "to see if it could be done. Once you've done it, it's not worth doing again," he says. He does, however, pass out software that helps other aspiring virogens build their own viruses. He describes his "virus creation library" (VCL) utility like a developer selling an application's ease of use. "You don't have to have a programming background to use VCL," he says.

Another virus writer in his 20s, going by the alias Hellraiser, acknowledges over the telephone, "I was always the rebellious type, so as soon as I got into computers I had to go to the rebellious part of the computer world—the underground hacking, phreaking, viruses. When you are a kid with a computer, what are you going to do? Do you want to go on public domain boards and download shareware and write messages on Fidonet? No, you want to do something cool."

Kane, however, doubts that many of the current, sophisticated viruses are the work of kids. "It takes a very talented programmer with a lot of experience," she says.

That would describe one of the most famous players on the virus stage, Dark Avenger. No one seems to know what he's avenging, but it's believed he started out as a computer science student at the University of Sofia in Bulgaria.

To Dark Avenger, his viruses are his passport. "The American government can stop me from going to the U.S., but they can't stop my virus," he boasted to one virus researcher. "The idea of making a program that would travel on its own and go to places its creator could never go was the most interesting thing for me."

His darkest contribution isn't a virus at all—it's a toolkit he calls the "Mutation Engine." It lets viruses change their appearance and internal structure as they spread, making them difficult to find. He's also written a kind of schizoid virus. The fast-acting version actively searches for targets, spreading and replicating itself on the host system and any other system connected to it. A timed-release variant slowly and almost invisibly eats away at data on a disk so

it's unlikely you'll notice until it's time to kiss your data good-bye.

He may be prolific, but he's also uncharacteristically shy. One person who's smoked him out is an American virus researcher named Sara Gordon. Asking to keep her employers anonymous, Gordon says she is an "independent researcher" at a Midwestern university who works under contract to several corporations as a security specialist.

She first came across Dark Avenger's name during an online virus conference. Participants lambasted his work. That intrigued her. She in turn managed to intrigue Dark Avenger, first by posting questions about him on several bulletin boards, and finally by challenging him to write a virus for her. Sure enough, early in 1992, a new virus called Dedicated appeared. In it, an internal string read, "We dedicate this little virus to Sara Gordon." Eventually, using a Bulgarian dictionary and a British BBS, she posted a message to him. He replied with a modern pen-pal request: to scan her photo into a graphics file and send it to him. She did.

In the atmosphere of paranoia in the virus underground, some don't believe that Gordon and the Dark Avenger have actually spoken. But if you ask her, she'll hand over transcripts of conversations she had with him to reveal what makes him tick.

He told her that he never imagined the viruses would hurt people, just data. In Bulgaria, he said, "PCs were just very expensive toys which nobody could afford and nobody knew how to use. They were only used by some hotshots or their children who had nothing else to play with. I was not aware that there could be any consequences. [My first] virus was so badly written that I never imagined it would leave the town. I only imagined it could leave the neighborhood."

Dark Avenger shrugged off any responsibility as neatly as an operator dropping a caller into voice mail. Like most of the virus writers, he separated his work from its effect. No system would become infected, he said, if people avoided pirated software. "It all depends on human stupidity, you know. It's not the computers' fault that viruses spread."

The Gumshoes: Choose Your Alias

Tracking virus writers and their antagonists is like walking into a convention of JFK assassination-conspiracy buffs. All the players—the authors, the security specialists, and the antivirus software developers—know each others' identities or at least aliases. They have their own unshakable beliefs about who's really responsible for the problem of spreading viruses.

Want wild theories? Some folks who claim to write viruses are actually cops trying to entrap the real criminals.

Want cynical motives? Ask yourself who benefits more from the spreading of viruses than the developers of antivirus software and security consultants. Some virus authors claim that antivirus software developers are responsible for spreading many infections just to boost software sales. Why would they say such a thing? Maybe it's because in the past at least one

Tips from the Virogens for Avoiding Their Work

Virus writers enjoy their work too much to give it up—and even if they mend their ways, there will always be newly adventurous technotaggers to take their place. So how do you avoid becoming one of their victims? Here, in their words, are what the virogens advise you to do. (The security professionals who track the virogens get their say in "Ten Tips from the Trackers," page 212.)

Aristotle: [Virus writers] are going to write something that is totally undetectable. That means that virus scanners are essentially useless. They act as coroners to tell you what it was that ate you. There is no education in the system to teach people how to use the computer so that they don't bring things [like viruses] in. They don't establish rules where if somebody brings in something from home and puts it on a company computer, they get fired. These are million-dollar investments we're talking about; they are not toys.

Dark Avenger: Antivirus products are as useless as viruses. The users spend much more money on buying such products and their updates than they would lose on data damage because of viruses. Viruses would spread much less if "innocent" users did not steal software and if they worked a bit more at their workplace, instead of playing games.

Hellraiser: Get a good scanner first thing. And [develop] a good eye to notice when something is wrong—files running slower than they should, weird error messages. If you turn on your computer and it says, "Mr. Virus has destroyed your hard drive," that's a clue.

Nowhere Man: The fact is that 99 percent of all viruses are not much of a threat if you have any kind of a clue. I'm not saying viruses don't hurt people, but usually when they affect people, it's almost always the person's fault.

TL: On my drive, I have 2,000 viruses just laying around and never in many years has one gotten loose. I don't run scanners. I just categorize what I take from people. I don't run things on my good machines. I don't understand why people actually get infected.

major antivirus maker has offered cash bounties to individuals or companies supplying examples of new viruses. That way, they can figure out a method to inoculate against it and sell updates. Are virus writers surviving and thriving because they have a ready market for their work?

That's ridiculous, counter the antivirus developers. Like police, lawyers, and judges, they wouldn't have anything to do unless some jokers were operating outside the bounds of ordinary society; in most cases, though, the antivirus software developers haven't caused the problems they're out to solve. Their intentions may be pure. (That didn't stop some of them from exploiting the Michelangelo scare to the hilt, even if they had nothing to do with encouraging the virogen who wrote it.)

Some of those same developers whisper that some academic virus "researchers" are actually creating the strains they claim to study. Other denizens of this world claim that Veselin Vladimirov Bontchev, currently a member of the University of Hamburg's Virus Test Center, is none other than the Dark Avenger himself; he denies the charge, insisting he's hot on the trail of his fellow Bulgarian.

Bontchev started following Dark Avenger's trail when he was director of the Laboratory of Computer Virology at the Bulgarian Academy of Sciences in Sofia. Bontchev believes there are currently about 4,100 known PC viruses in the world, with less than 10 percent—about 300—originating in Bulgaria. But he admits that's still a disproportionately large number of viruses for such a small group of users. He cites Russia, The Netherlands, Italy, and the United States as the major virus-producing countries.

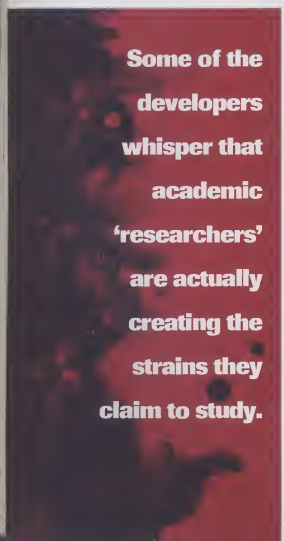
Bontchev describes Dark Avenger as "sick enough to enjoy causing trouble to other people. Most of his viruses are maliciously destructive, slightly and slowly corrupting your data, so that you do not notice it for a long time. When you eventually notice it, it is too late because the corrupted data is already on your backups and there is no way to determine which part of it is corrupted and which is not."

Dark Avenger is such a creep that the one piece of antivirus software he wrote snuffs two of his viruses but silently unleashes a third one at the same time.

Sadly, all Bontchev has to show for five years of study are some clues about Dark Avenger's style. He writes his viruses so that they have a round number of bytes, and he frequently refers to heavy metal groups such as Iron Maiden in his virus code. It's not clear what's going to happen if Bontchev collars Dark Avenger—Bulgarian law being vague on the subject of hacking—but he does say that he knows some folks who'd like to rough him up for the data he's destroyed.

Back here in the States, another cynical detective in the virus underworld is Joe Piazza, president of the Institute of Data Security and Integrity, a computer security firm in Wilmington, Delaware. He blames the antivirus software developers for priming the market with cash bounties. "It is absolutely in their best interests to keep the viruses flowing," he says, accusing them of significantly contributing to the nasties' numbers.

Of course, viruses also help keep Piazza and other security professionals in business, because they assess companies' exposure to security lapses. He believes companies will thrive or die based on the safety of their data. And in this oddly symbiotic world, he needs the virus writers, too. "The hackers and crackers are serving a good function—they are letting us know what the loopholes are so that we can fix them."



The Hideouts: Where Taggers Dare

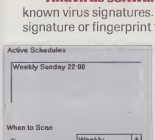
In this rats' nest of intrigue, where do the rodents hang out? Same place any group of technothusiasts hangs out—electronic bulletin board systems. On these BBSs, virus authors spew their nastiest bugs in hopes of getting not only the plaudits of fellow outlaws but also widespread distribution. People like Dark Avenger, Hellraiser, and Nowhere Man are heroes sanctified in great awe. Other authors—those stupid or unfortunate enough to be caught (like Internet worm creator Robert Morris, Jr.)—are categorized as either martyrs to the cause or cautionary examples of poor procedure. Not surprisingly, the antivirus makers also frequent these bulletin boards in search of the latest viruses.

A man who goes by the alias Aristotle is the system operator of one of these bulletin boards. At age 34, he's an old man among the virus kids. "People in the underground think because I'm 34, I'm some kind of fed," he says. Married and the father of two, he recently went back to school to complete his college degree and now does computer consulting

Digital Trip Wires for Safety

Believing that a virus won't attack you is a common mistake. Protect yourself. Whatever some denizens of the virus world think about antivirus software developers, we recommend you take precautions. Symantec (through the Peter Norton Group and the recently acquired Central Point), McAfee, and Reflex all make products that can keep a network or desktop PC safer by preventing, detecting, and helping to repair or recover from a virus attack.

Antivirus software works by scanning for known virus signatures. Every virus has a unique signature or fingerprint to identify itself. The software is also on the alert behind the scenes, looking for viruslike activity such as corrupted file or code trying to write to the boot sector. With a method called checksumming, it creates a numeric representation of the file, takes snapshots of the checksum, and compares it to the original file. A red flag goes up if something looks suspicious. To be effective, a virus must attach itself to an executable or load itself into memory and replicate. Antivirus software commonly isolates the virus and stops the replication, in effect, crippling the virus. If the files are infected, the damaged code is deleted and the proper data pieced back together and, in a sense, "cleaned."



McAfee VirusScan 2.1 lets you set the frequency and time of automatic scans to fit your company's schedule.

Look for alarm and report features in today's antivirus software products. Schedulers for routine scanning, configurable reporting features, and alarms are important, but these should be considered secondary factors. When selecting a package, make sure the one you choose has the following basic features: scanning capabilities for detection of known viruses; a TSR or some sort of resident program that continuously monitors not only for known virus signatures but also for viruslike activity; and the ability to remove a virus and then help to repair or recover from an attack.

Is your network environment compatible with the antivirus software package? Look at what kind of interaction you and your users have with the outside world (via notebooks, modems, and so on). Do you need to support multiple platforms? Be sure to check that the product's site license lets you install it on home computers or networks, as well as on all of your workplace desktops. Bringing infected floppies or files from home to the office is one of the easiest and most common ways to spread viruses.

Software is only as good as the user. You must always scan incoming floppies and files before you introduce them to your PC—even those from shrink-wrapped packages. Antivirus software experts recommend quarantining a dedicated PC to scan all foreign floppies before they are introduced to your system. Most of the top products automatically scan for viruses and viruslike activity, and won't let you install something that is infected. However, reckless users can turn this feature off or choose not to install that portion of the program.

Keep current with regular updates of virus signature files, since 40 to 50 new viruses are discovered each month. Updates are usually available quarterly and are mailed to users directly, or they can be downloaded from a bulletin board system, CompuServe, or America Online.

Back up data religiously. In the event that you are unable to clean up after a virus attack and your only option is to delete the infected files, you risk losing all your data and applications unless you have a clean backup copy of data and programs. Be sure to rotate the disks that you use for backups.

Educate your fellow users about the ramifications of viruses and the vital importance of scanning, updates, and backing up data. There's no worse killer of productivity than the wrenching cry of "virus!" Otherwise, using antivirus software is similar to flossing your teeth just before you go to the dentist—it's worthless. Unless you follow the regimen at all times, you're still at risk. LIESL LA GRANGE

Summary:	No Viruses Found
Items Scanned:	C:
File Type:	Program Files Only
Inoculation:	Disabled
Other Settings:	Compressed Files Not Scanned
Scan Time:	33 seconds

Item	Scanned	Infected	Cleaned
Memory:	Yes	No	No
Master Boot Record:	Yes	No	No
Boot Records:	1	0	0
Files:	541	0	0

Norton AntiVirus 3.0 scans for known viruses, looks for virus activity in the places they're most likely to infect, and inoculates files and memory against corruption.

Ten Tips from The Trackers

What the Experts Advise:

1 Use antivirus software that combines scanning, checksum, and monitoring facilities.

2 Update your scanning software regularly to make sure it can find newly unleashed viruses.

3 Don't use pirated software—you don't know where it's been.

4 Don't move copies of executable files from one computer to another; always install from the distribution disk.

5 Don't boot from a floppy disk of unknown origin; perform a virus scan before using files from such a disk.

6 Treat executable files downloaded from BBSs with suspicion; scan the programs before use.

7 If your system is part of a network, use passwords and other security measures to block unauthorized access.

8 Don't use an obvious password for your account, and don't use the same password on multiple systems.

9 Back up your data files regularly, and rotate the backup disks so that you have copies of files on different disks going back several weeks. Keep backups of your applications' disks, too.

10 If your system begins to act strangely, if program files behave in an unexpected way, or if a file's length or "last saved" date changes unexpectedly, assume you have a virus and perform an aggressive scan. Have a plan in place for notifying users of a possible virus attack.

work for a government contractor.

He is also a self-proclaimed expert on the way antivirus makers purposely or accidentally move viruses around the world. He says that on many virus BBSs, the system operators require users to upload contributions in exchange for downloads of the latest files. He accuses antivirus makers of often adding a new infectious agent for each one they retrieve.

Aristotle tracks viruses the way some folks track carrier pigeons. "I'd create a virus and give it out to somebody, then delete it from my system, and see what happens. The first one I gave somebody showed up three days later on a bulletin board in Switzerland."

Aristotle's no anomaly. A 20-year-old computer store employee who goes only by the initials TL is already a retired virus BBS sysop. He's moved on to phone phreaking—using long-distance lines without paying—and was, naturally, calling on what he said was a temporary and untraceable line.

TL insists that anyone outside the virus clique couldn't possibly understand the kick somebody gets out of having the power to destroy an entire computer system. "When you hack a system, it takes no brain at all to come in and nuke everything, but it takes one hell of a brain to remain on the system. It is a lot more challenging to avoid antiviral software than it is to nuke a drive."

As for the idea of an online community of taggers, TL compares it to a literary roundtable. Writing viruses shouldn't be illegal—it should be thought of as a creative process like writing a book. "Some people write books about suicide. That's a lot more destructive," TL insists. "I don't think it should be illegal to write viruses, but it should be to spread them."

But where's the glory in being the author of a work you dare not acknowledge publicly? Panda Systems' Pam Kane has an interesting analogy for the sort of fame that "successful" virus authors might achieve. They're like some wealthy crazy who hires a thief to steal a famous work of art. "The person who now owns it cannot [display it]. It hangs in a very small room of a very large house."

She insists that we're still not safe from really nasty viruses. They're not likely to be posted on BBSs frequented by The Unforgiven and his ilk, because that gives the antivirus developers an immediate heads-up that a new strain is a potential threat. "If there is a seriously malevolent virus writer out there," says Kane, "he will not put it up on a BBS."

It's the same old story: When you're walking in a bad neighborhood, you've gotta watch your back. But now that your PC makes the entire world your neighborhood, you've gotta watch your disk. They'll find you if you let them.

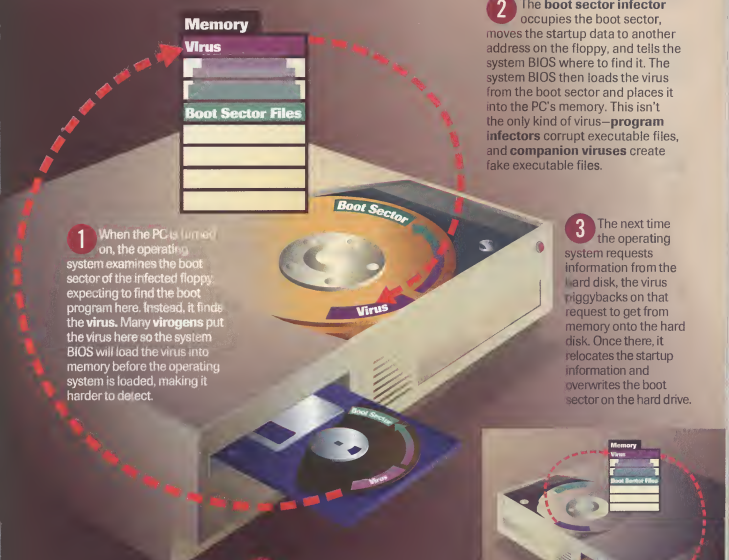
COREY SANDLER *has written more than 70 books on computers, video games, and travel. Several years ago, his own lab was paralyzed by a virus from a commercially distributed video driver from Taiwan.*

'The first virus I gave somebody showed up three days later on a bulletin board in Switzerland,' says Aristotle.

HOW IT WORKS

HOW VIRUSES GET INTO YOUR SYSTEM

Computer viruses are like human viruses—they come from contact with something that's already infected. The way in which the digital kind snuggles into your computer is remarkably simple.



1 When the PC is turned on, the operating system examines the boot sector of the infected floppy, expecting to find the boot program here. Instead, it finds the **virus.** Many **virogens** put the virus here so the system BIOS will load the virus into memory before the operating system is loaded, making it harder to detect.

2 The **boot sector infector** occupies the boot sector, moves the startup data to another address on the floppy, and tells the system BIOS where to find it. The system BIOS then loads the virus from the boot sector and places it into the PC's memory. This isn't the only kind of virus—**program infectors** corrupt executable files, and **companion viruses** create fake executable files.

3 The next time the operating system requests information from the hard disk, the virus piggybacks on that request to get from memory onto the hard disk. Once there, it relocates the startup information and overwrites the boot sector on the hard drive.

4 Now that the virus has established itself, every time the system is booted from the hard drive, the virus is loaded and can infect any disk via the same route in reverse. Unfortunately, some viruses, such as **stealth** or **polymorphic viruses**, are specifically designed to protect themselves from antivirus software as they spread.

KEY WORDS

Virus: The difference between a virus and any other program or block of program code is that a virus replicates itself to overwrite other data, unlike other executable programs.

Virogen: In the virus community, the people who write viruses are called virogens, as in virus generators.

Boot Sector Infector: These reside in the boot sector and are transmitted through the use of infected floppy disks.

Program Infector: A virus that inserts itself into an executable program is called a program infector. Executable files include COM, EXE, SYS, OVL, MNU, and PRG files.

Companion Virus: To infect the system, a companion virus will create a COM file with exactly the same name as an existing EXE file. That way, when the user types the name of a program to be executed, the virus is accessed first. Under MS-DOS, the COM files are executed before the EXE files.

Stealth Virus: A virus that employs a mechanism specifically aimed at defeating an antivirus program takes its name from the idea of a bomber evading radar. A stealth virus makes a copy of original code and stores it elsewhere, redirecting calls to the clean data while the virus proceeds to infect the system.

Polymorphic Virus: A virus that rewrites its own code strings so that later generations don't resemble the parent is known as a polymorphic (shape-changing) virus. This generational masking makes it more difficult for antivirus scanners to detect the new offspring.

Help

BRIAN LIVINGSTON GOES ONLINE FOR WINDOWS UPGRADES

Broken Windows? Get These Patches

Despite everything you've heard and read about Chicago (the next version of Windows), almost everyone is still using some flavor of Windows 3.1. What you may not know is that while the release of Windows 4.0 is still months away, Microsoft has been upgrading good old Windows 3.1 in the meantime. Unlike DOS, which operates mostly with a single command interpreter (COMMAND.COM) and two "hidden" files, Windows depends on *hundreds* of files—more than 400 on the distribution disks. Depending on your hardware configuration, the files appropriate for your display, mouse, and so on are copied to your hard drive when you install Windows. Not surprisingly, an improvement to one or two of these files can make a big difference in the smooth operation of Windows.

You may never have heard about these improved files because Microsoft does little to publicize their existence. When a file gets a bug fix or performance enhancement, Microsoft places it on a BBS. From that point on, the file may be copied to other electronic systems for wider distribution. Unless you happen to ask a technical support person at Microsoft about a specific problem you have, you will probably never hear about these fixes. Unlike new releases of products like Microsoft Word and Excel, driver bug fixes don't get an advertising budget.

The Master File The key to these tweaks and patches is an obscure little text file called WDL.TXT. This is sort of a table of contents to the Windows Driver Library. Unlike public libraries, which store decades' worth of written output, the Driver Library holds only those files that are new or upgraded since Windows 3.1 came out in April 1992. Even so, the library includes more than 200 files.

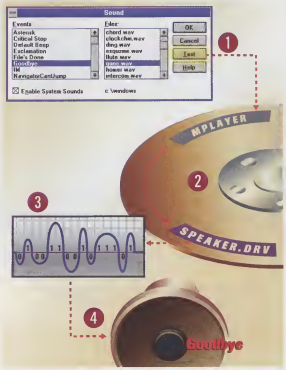
You can obtain WDL.TXT through a variety of means. One of the best is to dial Microsoft's own internal BBS at (206) 936-6735 with your modem set to 8 data bits, no parity, and 1 stop bit. Microsoft maintains this BBS specifically to distribute new files to users, and the BBS is first to get the latest versions. It's also free of any connect-time charges; you pay only for the cost of the long-distance call to Redmond.

An even cheaper way to get the upgrades you need—if you use the Internet for data access—is to obtain the files directly from Microsoft's Internet server at ftp.microsoft.com. Depending on your method of connecting to the Internet (through a direct connection, a mail gateway, or a service provider), this can be cheaper than a phone call.

If you have a CompuServe account, you can download WDL.TXT from the MSL forum (type GO MSL at any ! prompt). MSL stands for the Microsoft Software Library, which also includes forums that support Microsoft applications and DOS, as well as the Windows Driver Library. From the text menus, specify WDL.TXT, then type DOWN and choose a protocol (CompuServe B, Xmodem, or Ymodem) to copy WDL.TXT to your PC.

What can you do if you have no modem or Internet access? It's still possible to see whether any new drivers or

HOW IT WORKS A MUCH-IMPROVED **SPEAKER** DRIVER



SPEAK.EXE is one of the many files listed in WDL.TXT. This speaker driver plays WAV files through your internal speaker, so you don't need a sound card. Download it, execute it (it's a self-extracting file) and install it. Here's how this driver works:

1. Play: You play a WAV file from Windows.

2. Pass: MPLAYER, the Windows Multimedia Player, passes control of the sound to SPEAKER.DRV.

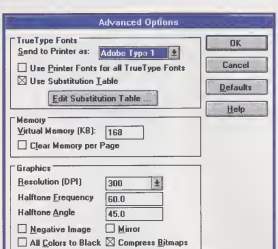
3. Prepare: SPEAKER.DRV acts as a digital-to-analog converter, converting the WAV file to audio format so that your internal speaker can reproduce it.

4. Produce: The internal speaker plays a tinny but recognizable sound.

WORKAROUND

IMPROVE **PRINTING** RIGHT NOW

PostScript Update: Don't settle for your existing printer driver. One of the improved drivers described in WDL.TXT is Version 3.58 of the Windows PostScript driver, which now works reliably with more fonts. This lets you create a catalog of all your fonts (if you have scores of them), or work with other complex documents.



other upgrades apply to your software. Call Microsoft's Windows telephone support at (206) 637-7098 to find out whether there is a new file that fixes specific problems you have, or ask to have a copy of WDL.TXT mailed to you.

The Windows Driver Library is made up almost entirely of new driver files for three types of hardware: printers, video adapter boards, and network adapter boards. Unfortunately, the Library has no solution for the biggest problem afflicting Windows users—the 64K limit on the Free System Resources that you see in Program Manager's Help, About box. When the resources drop below about 20 percent (after being consumed by icons, toolbars, and other GUI flotsam), the performance and reliability of Windows becomes erratic. There will be no solution to this problem until the release of Windows 4.0 expands these resources.

Step Up to 3.11 (Sort of) Something else that you won't find in WDL.TXT, but which *is* available now, is a "step-up" upgrade file that supposedly converts Windows 3.1 into Windows 3.11. This file, WW0981.EXE, does not upgrade Windows to the peer-network product, Windows for Workgroups 3.11. Nor does it truly upgrade a Windows 3.1 system to the same Windows 3.11 product that Microsoft has been selling for several months. (To do this, WW0981.EXE would have to contain all of the 200 or so drivers in the Windows Driver Library. The presence of these "refresh" drivers is the main difference between Windows 3.1 and Windows 3.11.)

Instead, WW0981.EXE merely includes a handful of upgraded printer and video drivers, along with a few "kernel" files and slightly improved Novell NetWare drivers. You don't really need to install this upgrade unless one of the following describes you:

- You need a new PostScript driver or new "universal" printer driver. Don't bother downloading these new drivers unless you have been getting error messages from your PostScript printer or have been having problems with a "mini" Windows printer driver (a driver smaller than 50K) that relies on the universal printer driver—UNIDRV.DRV.
- You want a new KRNL386.EXE file that works better with some software. Specifically, the new kernel more accurately handles some situations in which third-party software installs itself and then restarts Windows after its setup routine is completed.
- You're looking for new common dialog boxes (such as File Open) that work with diskless workstations (PCs that load Windows from the network).

Better Drivers This leaves us with the individual goodies that are listed in WDL.TXT. Unlike the files in WW0981.EXE (which few people need), almost every Windows user will probably find one driver or another in WDL.TXT that will work better than his or her current drivers. The best stuff you'll find is for printers, graphics, network, audio adapters.

Almost every major printer manufacturer is represented in the Windows Driver

CONTENTS

WINDOWS: *Windows for Workgroups 3.11 can speed up your PC. Ed Bott fills in the details.* **218**

DOS: *Jeff Prosise shows you how to add the /S switch to all of your commands.* **224**

APPLICATIONS: *Reach out and touch someone's computer with remote access software.* **230**

NETWORKING: *Need a nose for a NOS? Here's what to look for in a new network operating system.* **238**

TOOLKIT: *Woody Leonhard and Vincent Chen go for entertainment value by creating a CD jukebox front end.* **242**

PC CONTACT: *Download this month's files and talk to editors online.* **250**

TECHNOLOGY:

HOW IT WORKS: *Hello, anybody out there? Ron White explains voice recognition.* **252**

F1: *Robert L. Hummel takes apart modem standards to help you buy.* **254**

SPEC WATCH: *The name of the game is color, and the solution is ink jet.* **263**

Library with drivers that have been improved or created since the release of Windows 3.1. The fixes range from the elimination of disastrous General Protection Faults (GPFs) to the mere addition of more paper sizes in Windows' Print Setup dialog boxes.

Here you will find new drivers for Apple LaserWriters, Brothers, Canon BubbleJets, Citizens, Compaq Pagemarqs, Epsons, Hewlett-Packards (including 4 DeskJet, 15 LaserJet, 2 PaintJet, and 2 QuietJet models), IBMs, NEC Pinwriters, Panasonic KXs, Stars, Toshibas, and many others.

The biggest advance in the graphics adapters category is probably in the multimedia video drivers, which support "paletized VGA" and other functions for CD-ROM–based presentations. But if you've purchased a multimedia system lately, you almost certainly have these drivers already installed on your hard drive.

The Windows Driver Library is also the final resting place for those dominant graphics standards of yesterday—EGA, Hercules, and (shudder) CGA. Remember running Windows 1.01 in CGA's lovely 320-by-240 monochrome mode? Sorry, I guess I'm showing my age.

More relevant to today's Windows users are drivers that include upgrades for graphics adapters from ATI, Cornerstone, HP, S3, Tseng Labs, Western Digital/Paradise (90C30- and 90C31-based boards), and a bunch of others.

There's also a new Super VGA driver to replace the one provided with Windows 3.1. The new driver supports 1,024-by-768 resolution, but only for adapters that are 100 percent compatible with the VESA specification for this resolution—a claim few adapters could make until recently.

Virtually every major manufacturer of network adapter boards has a new driver in the library. There are simply too many to list here. Suffice it to say that if you use a network, and you've had reliability or performance problems with Windows, search WDL.TXT for a new network adapter driver.

Check out the new, improved audio adapters. There are new drivers for the Artisoft Sounding Board, IBM M-Audio Adapter, and ThunderBoard in the library. But the utility that will interest the most Windows users is SPEAK.EXE—a driver that Microsoft says will play sound effects on a plain old internal speaker, with no sound board required. Apparently, SPEAK.EXE works on only about 90 percent of all PCs, so if you have an odd system, you may still get nothing other than the usual beep. But it's definitely worth a try.

Grab Bag The remaining contents of the library can only be described as a potluck of peculiar add-ons. There is a sort of "elephant's graveyard" quality to some of these offerings: The Reversi game that was dropped from Windows 3.1 is here, as well as the forgotten MS-DOS executive shell from Windows 2.x. And you'll find some wallpaper and sound files that were too big to fit on the Windows 3.1 disks, like Arches, Chitz, Marble, and Tartan (wallpaper), and Chord and Tada (sound files).

Two files that are useful to technical support people are WININI.WRI and SYSINI.WRI. These files contain descriptions of the meanings of most settings in your WIN.INI and SYSTEM.INI files, respectively. If you have a burning curiosity about what a setting in either of your INI files does, the WRI files (in Windows Write format) probably contain the answer. These new files are more extensive than the WRI files that are included with the Windows 3.1 distribution diskettes.

Like other files in the Windows Driver Library, WININI.WRI and SYSINI.WRI are compressed. You'll need to download the file WRI.EXE and run it once (as described in "Installing the New Drivers," at left) to decompress both WRI files.

One of the most intriguing files in this section is the Access driver. When you install this driver, it makes your keyboard easier to handle, in several alternative ways. For example, you can configure the driver so that you don't have to hold down two keys at once for key combinations like Ctrl-Esc (which brings up the Task List). You can press and release the Ctrl key, and then press the Esc key independently. This driver was developed for people with limited dexterity, but it can be quite useful for individuals who aren't physically challenged, too.

You may not find the solution to all your problems online, but Microsoft's patches, fixes, and updated drivers can certainly make Windows better. See you online.

HOW TO DO IT — INSTALLING THE NEW DRIVERS

Uncompress and Run: Once you've downloaded the drivers you need from WDL.TXT, you need to take one more step—and it's an important one. Each EXE file in the library is actually a compressed file that contains the driver you want, as well as a text file that describes the specific procedure to install the driver. You may think you don't need to read no stinkin' manuals, but each driver has a different installation routine, so you really do need to read these instructions.

Most importantly, you need to make sure that you place each EXE file in a separate directory before you extract its files. This is because the files probably have the same names as existing Windows files. Extracting these files into a Windows directory before they are properly installed can cause Windows to crash.

You must run each filename once at a DOS prompt in that file's separate directory to make the self-extracting routine work. For example, if you put the SPEAK.EXE file in a C:\DRIVER directory, go to that directory and type SPEAK to extract the speaker files.

Don't ask me why Microsoft can't populate the Windows Driver Library with self-extracting files that work in Windows itself. Maybe Bill Gates can whip up a GUI self-extractor some weekend.

In any event, you should be able to find a driver in the library that will provide you with better reliability, or—in the case of the tiny speaker driver—hours of pointless experimentation with Windows' sound files!

BRIAN LIVINGSTON *is the author of* Windows 3.1 Secrets *(1992) and* More Windows Secrets *(1993), and co-author of* Windows Gizmos *(1994). All three are published by IDG Books.*

I don't understand

my new healthcare plan,

Latin,

my parents,

how Teru can be so popular,

why athletes make

more money than doctors,

why everybody makes

more money than me,

and why anyone would buy

an NEC SuperScript™ 610 printer.

NOVEMBER 1992

BEST SELLER
DESKTOP BUSINESS
PRINTER

$50 REBATE
7/1/94 THROUGH 9/30/94

Why? Because it's the fastest and easiest personal laser printer you will ever use.

Besides you're smart enough to recognize a good idea when you see one. You're not afraid of new technology. And you're definitely tired of waiting every time you print from Windows.

But still you have your doubts. What exactly is this new technology? And what's in it for you?

Well, it's called GDI printing and it works like this. GDI (Graphical Device Interface) is the native language of Microsoft Windows.™ Because the SuperScript 610 thinks and speaks the same language it doesn't have to translate or reformat your documents before it can print. Which means it's 30% to 300% faster than ordinary printers. And what you see on the screen is truly what you get.

Okay, this is obviously a great Windows printer. But can it print PCL and DOS? Of course. As long as you open the application from within Windows. There's even a $99 PostScript™ option if you need it.

With all this sophisticated technology, you'd expect the 610 printer to be complicated and hard to use. But it's actually much easier to use than ordinary printers. And it only takes minutes to install.

To achieve this kind of ease we did have to eliminate a few things, however. Like the controller. Why have one when the PC can do the file processing? It's faster and more efficient. It also allows you to print fonts and graphics without any limitations. And every time you upgrade your PC, you automatically upgrade your printer.

We also moved the operator panel to the PC screen — where it belongs. That way graphical displays and animated icons can show you exactly what's going on at all times.

By the way, the SuperScript 610 is extremely compact, 300 dpi, prints 6 pages per minute and it comes with a 2-year overnight replacement warranty.

And it costs under $500. What's so hard to understand about that? For more information, call 1-800-NEC-INFO or for details via fax, call NEC FastFacts™ at 1-800-366-0476, and request document #SW610.

SuperScript and FastFacts are trademarks of NEC Technologies Inc. All other trademarks and registered trademarks are the property of their respective owners. The Energy Star emblem does not represent EPA endorsement of any product or service. © 1994 NEC Technologies Inc. NEC-SSWEB2006H-R3(6/94)

NEC

Circle 219 on reader service card.

TUNE WINDOWS FOR WORKGROUPS 3.11

A Truly Better Windows than Windows

If there's an award for most puzzling product name, Windows for Workgroups 3.11 would be the hands-down winner. Yes, this version of Windows includes peer-to-peer networking capabilities, but it also works just fine in a "workgroup" of a single PC. And although the Windows interface is virtually unchanged, look under the hood and you'll see a far more radical upgrade than the minor numbering change would suggest. This is the new Windows standard. Most PCs sold today come with Windows for Workgroups 3.11 preinstalled. If you're using Windows 3.1, you might want to upgrade even if networking isn't on your must-have list. In exchange for 10MB of disk space, you get better performance, thanks to 32-bit virtual device drivers developed for the next generation of Windows (currently known as Chicago). You also get an improved File Manager, a surprisingly useful Clipboard manager, and a built-in send/receive fax utility.

Most of the Windows expertise you've developed over the years is transferable to Windows for Workgroups 3.11. But there are a few important tune-ups you might overlook, because they're masked by familiar dialog boxes.

• Start smoother. Because it relies on protected-mode drivers, Windows for Workgroups 3.11 no longer supports standard mode, so the WIN /S option doesn't work anymore. If you need to turn off networking, however, you can do so when you start Windows for Workgroups with the command WIN /N.

• Share smarter. Under Windows 3.1, the only way for databases and other applications to manage file locking and sharing is via the DOS utility SHARE.EXE. In fact, some applications like Word 6.0 for Windows automatically insert a SHARE line in AUTOEXEC.BAT.

Windows for Workgroups 3.11 manages file sharing with VSHARE.386, a 32-bit virtual device driver that completely replaces the 16-bit real-mode DOS utility. VSHARE is installed by default under Windows for Workgroups 3.11. To verify that it's set up properly, look in the [386 Enhanced] section of SYSTEM.INI for the following line:

```
device=VSHARE.386
```

With VSHARE installed, you can safely remove the SHARE line from your AUTOEXEC.BAT file—and you'll have one less TSR to worry about.

• File faster. The most noteworthy new feature in Windows for Workgroups 3.11 also has the most confusing name. It's called 32-bit file access, and when properly configured, it dramatically speeds up hard disk reads and writes.

Two virtual device drivers combine to make 32-bit file access possible. A protected-mode driver, VFAT.386, replaces the 16-bit DOS file allocation table (FAT) with a faster, 32-bit file system. VFAT's performance-boosting partner is VCACHE.386, which similarly replaces SmartDrive's 16-bit cache with a 32-bit protected-mode cache.

Don't confuse Windows for Workgroups' 32-bit file access with the 32-bit disk access feature introduced in Windows 3.1. The latter won't work with most SCSI and ESDI drives, a few IDE drives, or compressed disks. But even if your hardware won't support 32-bit disk access, you can probably use 32-bit file access, thanks to another Windows for Workgroups virtual device driver, the real mode mapper (RMM.D32), which routes VFAT requests back to DOS for processing.

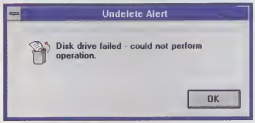
By default, 32-bit file access is not enabled. To turn it on, open Control Panel, double-click on the 386 Enhanced icon, click on the Virtual Memory button and then on the Change button. Make sure the box labeled "Use 32-bit File Access" is checked, then choose OK.

There are several situations under which 32-bit file access won't work. Fortunately, it's easy to avoid most of them:

• Watch out for real-mode DOS utilities. Real-mode network redirectors and

WORKAROUNDS UNDERMINED UNDELETE?

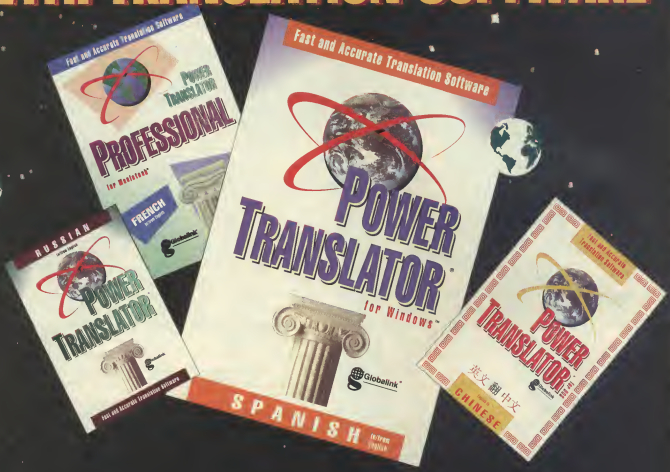
Wrong Answer: When you run the Windows version of Microsoft's handy Undelete utility (MWUNDEL.EXE) with 32-bit file access enabled, you might see this error message, or a similar one.



The Fix: The utility is trying to write directly to the disk via DOS interrupt 26, a Windows for Workgroups no-no. Instead, turn off 32-bit file access or exit Windows and run the DOS version of the Undelete utility.

EXPAND YOUR WORLD WITH TRANSLATION SOFTWARE

New Professional Windows Version! Network, word processor support, WYSIWYG text formatting



Imagine how far you could expand your horizons if you could communicate in languages other than your own. Now you can with Power Translator®, the fastest and most cost-effective way to produce highly accurate draft translations of letters, faxes, contracts, brochures, and much more.

Bilingual screens and manuals make Power Translator easy to learn and use. You can enter text interactively, import a text file, or scan in your entire text. Power Translator also comes in a **PROFESSIONAL** version that includes industry-specific dictionaries, such as Legal, Telecommunications, and Computer, that you can customize to meet your requirements.

Translate from English to or from any of these languages:

Spanish	**French**
German	**Russian**
Chinese (English to Chinese only).	

Power Translator products are available for Windows, Macintosh, DOS, OS/2, and UNIX.

Power Translator and Power Translator Professional are available from your local computer retail store. Or call:

800-255-5660

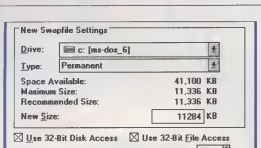
Globalink™

YOUR GLOBAL LANGUAGE LINK

Circle 226 on reader service card.

CAUTION MISSING DIALOG DIGITS

Crunched Number? When you run Windows for Workgroups 3.11 with 32-bit file access enabled and a cache size over 9,984K, the cache size in the Virtual Memory dialog box of the Control Panel is truncated. It should read 10240.



memory-resident programs that keep a file open while Windows loads will interfere with 32-bit file access.

• Steer clear of SUBST, ASSIGN, and JOIN. Because of the way they tamper with file and directory names, the external DOS commands SUBST.EXE, ASSIGN.COM, and JOIN.EXE are incompatible with Windows for Workgroups' 32-bit file access.

• Compress with care. The DoubleSpace utility in MS-DOS 6.0 won't work with 32-bit file access. Later versions of MS-DOS fixed this problem, and Stac Electronics' Stacker 4.0 also works well with VFAT. Stacker 3.1 (or earlier) users may wish to upgrade to Stacker 4.0 if they can, to ensure compatibility.

• Keep your cache size down. Low memory can cause VFAT to behave unpredictably. See "Cache Flow," below for advice on how big to set VCACHE.

• Have a safety net handy. To disable 32-bit disk access and start Windows for Workgroups 3.11, type WIN /D:F at the DOS prompt. You can just as easily disable 32-bit file access with the command WIN /D:C. Although disabling either (or both) of these decreases performance, it shouldn't affect other aspects of your system.

Cache Flow VCACHE.386 provides the caching on VFAT-enabled drives and network drives, while SmartDrive caches CD-ROM and floppy drives. Memory used by each cache is locked out of reach of the other. So setting the right cache size is a question of balancing the amount of memory devoted to VCACHE and SmartDrive.

How much memory should you devote to VCACHE? The theoretical maximum size is a staggering 2GB. Since most Windows users have a slightly smaller RAM budget, the 386 Enhanced dialog box in the Control Panel stops at a healthy 24,576K.

In practice, cache size is limited by the amount of physical RAM on your system. Set the cache size to a number that's larger than the physical amount of RAM available and VFAT won't work. If you set it to a smaller number that doesn't leave enough working room for Windows, you'll find disk reads and writes that should take nanoseconds now take forever.

If you don't have a CD-ROM drive, the solution is simple: Get rid of SmartDrive. If you need both caches, make sure that the amount of memory allocated to SmartDrive's WinCacheSize parameter and the cache size allocated to VCACHE.386 do not total more than 30 percent of your RAM.

On a machine with 8MB of RAM, you might choose to allocate 2048K to VCACHE. In that case, set the SmartDrive WinCacheSize (the second value in the SmartDrive command line) to 384K. ED BOTT

PC Contact WORD GADGETS

WOPR 6.0

Woody's Office Power Pack (WOPR) 6.0 is a much-needed Word 6.0 add-on. It includes a sophisticated file manager with immediate access to your most frequently used files and directories; a fancy, flexible envelope printer that can even handle logos; an icon editor; a clip art "scrapbook"; and much more. Download WOPR6L.ZIP from PC Contact's data library 3 (Utilities/Misc.). See page 250 for information on accessing PC Contact or ordering the disk from Public Brand Software.

WIN TIPS

MAKE TEXT

Problem: *Cardfile doesn't export to plain ASCII files.*

Solution: Install the Windows Generic/Text Only printer driver, which is useful for creating text files. Select Main, Control Panel, Printers, Generic/Text Only, Install, and insert the original Windows disk as prompted. Once the driver is installed, use it with Cardfile to export your card file databases to text files by selecting File, Print Setup and selecting the Text Only printer. When you print, you'll print to a text file instead of an actual printer. You can also use it with Terminal to capture log files of your Terminal sessions (something Terminal ordinarily can't do). Use it with any application to create plain-text files you can import anywhere, or print on any printer.

DYLAN TWENEY
SANTA BARBARA, CALIFORNIA

DOS OR SHELL?

Problem: *You keep forgetting that you're in a Windows DOS shell and you shut down without returning to Windows.*

Solution: Create a flashing message to remind you to return to Windows. Using a text editor such as EDIT in DOS 6.x, add the following line to your AUTOEXEC.BAT:

```
SET WINPMT=$E[36;5m Type ↵
^EXIT to return to Windows ↵
^$E[m$_$P$G
```

This changes your DOS prompt when you're in a DOS session under Windows. You need to load the ANSI.SYS driver to make this sequence work. Add the following line to your CONFIG.SYS:

```
DEVICE=C:\DOS\ANSI.SYS
```

Then reboot your computer.

YOSHIKI OKADA
TEL AVIV, ISRAEL

HIDDEN BEHIND WINDOWS,™ SOMETHING IS QUIETLY DEVOURING YOUR SPEED AND STORAGE. PIECE BY PIECE. BYTE BY BYTE.

You may not have spotted it yet, but something is preying on the storage and operating speed behind your Windows. Scraps of every program you ever thought you had deleted are still in there. UnInstaller properly disposes of the dead data, restoring disk space and operating speed in seconds. For a suggested price of only $69.95, UnInstaller shoos the scavengers away, leaving Windows as clean as the day you bought it. Only UnInstaller cleans Windows.

UNiNSTALLER™

VERSION 2.0

1994 WIN SOLES W 100 WINDOWS PROGRAMS

MICROSOFT WINDOWS COMPATIBLE

UnInstaller is available at resellers everywhere.
Or call 800-922-3383 to order your copy today.

UnInstaller is a trademark of MicroHelp, Inc. Windows is a trademark of Microsoft Corp.

Circle 128 on reader service card.

WINDOWS EXCLUSIVE

Problem: *You use Windows exclusively and never go to a DOS prompt.*

Solution: Make Windows start on boot-up and restart automatically whenever you try to exit from it. All you need to do is add the following lines to the end of AUTOEXEC.BAT:

```
:STARTWINDOWS
WIN
ECHO ↲
↳Press any key to restart Windows, ↲
↳or press Ctrl-C to return to DOS.
PAUSE > NUL
GOTO STARTWINDOWS
```

DYLAN TWENEY
SANTA BARBARA, CALIFORNIA

ICON FONTS

Problem: *When you minimize an application, you want its name displayed in a font of your choice.*

Solution: By default, Windows uses the innocuous MS Sans Serif. To change it, open WIN.INI (from Program Manager, select File, Run, and type WIN.INI), go to the [Desktop] section, and add the line IconTitleFaceName=Times New Roman (or choose any font to the right of an equal sign from the [fonts] section of WIN.INI). Now all application names will appear in your font.

JOHN MONTGOMERY
HELP EDITOR

FLYING SMILES

Problem: *The Flying Windows screen saver is just plain boring.*

Solution: Create your own screen saver with flying smiles, skulls, glasses, or any of the dozens of other symbols available. The Flying Windows screen saver uses character 0255 in the WingDings character set (which is the Windows logo). All you have to do is replace that symbol with the character of your choice. First, go to the Accessories group, select Character Map, choose WingDings from the Font list, and find a character you want to use. Click on that character, and watch the bottom right status bar display a keystroke equivalent. For example, J is a smile, L is a mad face, and $ is a pair of glasses. Note: These characters are case sensitive. Before you start, go to File Manager and make a copy of the SSFLYWIN.SCR file in the \WINDOWS directory, just in case. Then open Write (also in the Accessories group), select File, Open, select SSFLYWIN.SCR and click on No Conversion. Proceed with caution—do not add or delete anything other than as instructed. If you make a mistake, exit without saving, and start over. Select Find, Find, and type Flying for the search text. Click on Cancel when you have a match, and type anything you want over the word Windows, as long as it's the same number of characters (seven). Again, select Find, Find, and type DISPLAY for the search text. Click on Cancel when you're there. Type your character over the character to the left of the word DISPLAY—it may appear as an accented y. Select File, Save and then exit. To activate this screen saver, go to Main, Control Panel, Desktop, Screen Saver, and you'll see Flying Smiles or whatever you've named it. You can easily create several of these by copying the original file and making different changes to each copy. Be sure to leave the SCR extension, or Windows won't recognize it as a screen saver.

MATTHEW J. LAKE, SENIOR EDITOR AND
YAEL LI-RON, ASSOCIATE EDITOR

PROGMAN TITLE

Problem: *You want to customize Program Manager's title bar.*

Solution: In File Manager, create an association for the GRP extension to PROGMAN.EXE. Then create a new program item in the StartUp group by selecting File, New, Program Item. Type the text you want to display on Program Manager's title bar in the Description box and type MAIN.GRP in the Command Line box. Next time you launch Windows, your personalized title will appear. Note that this operation won't work if you load StartUp minimized.

MIKE SERRANO
LAFAYETTE, COLORADO

ENVIRONMENTAL DISASTER

Problem: *You encounter an "Out of Environment Space" error message when running DOS under Windows.*

Solution: Open DOSPROMPT.PIF with the PIF Editor. In the Optional Parameters box, type /E:800, then save your changes and exit. This will expand the environment space for your DOS session to 800 bytes. If you still get "Out of Environment Space" messages, increase the number until the errors go away.

RONNY RICHARDSON
CHAMBLEE, GEORGIA

HOT TIP RENAME YOUR PRINTER

Problem: You want to give your printers more interesting, "colorful" names, Macintosh-style.

Solution: Mac users can name their printer drivers anything they want, but in Windows, your choices are limited to the printer model. Here's a way around this limitation. In Notepad, open CONTROL.INF, which resides in the \WINDOWS\SYSTEM directory. Identify the line that contains your printer's name, for example:

```
6:pscript.DRV,6:HPeli523.WPD,"HP LaserJet IIISi PostScript:",↲
↳"DEVICESPECIFIC"
```

Insert any fun name in place of your printer's name in quotes and leave the rest of the line intact. Save and exit Notepad. To enable this name, select Main, Control Panel, Printers, click on Add and double-click on your printer's new name.

NOEL NYMAN
SEATTLE, WASHINGTON

Science has found a cure for snoring. At least during your presentation.

PCC Best
PC Computing
BEST 200
June 1994
Tektronix Phaser 220i

It's the new Phaser™ 220 color printer by Tektronix®. It's affordable. It's easy to use. And it's the best way to keep people awake without the use of costly stimulants. How? Quite simply, amazing color. The Phaser 220's SuperCell 600™ technology allows you to print a whopping 600 x 300 dots-per-inch. And in lay terms, that's a lotta dots. And a lotta dots means your annual reports will yodel, your pie charts will do backflips and your bar graphs will announce their presence with authority. Plus you get all this great color at two pages per minute on most common laser papers. At this speed, it should come with an airbag. The Phaser 220 also offers true Adobe® PostScript™ Level 2 and supports PCs, Macs, workstations and just about every network interconnect. Add to this the fact that it's reliable, has multiple paper trays and a huge print capacity and you've got yourself one tough workhorse. For a free Phaser 220 print sample or the name of your nearest Tektronix dealer, call **800-835-6100**, department 34D. For faxed information, call 503-682-7450, and ask for document #5003. But don't wait too long. Because business is getting more and more competitive. And if you snooze, you lose.

Overheads

Desktop Publishing

Reports

The Phaser 200 series starts at a suggested retail price of only $2,995. Who says money can't buy happiness?

Tektronix

Phaser is a trademark of Tektronix, Inc. PostScript is a trademark of Adobe Systems, Inc. All other marks are trademarks or registered trademarks of their respective companies.

Circle 121 on reader service card.

CREATE YOUR OWN RECURSIVE SWITCH

Run DOS Commands All Over the Place

With few exceptions, DOS's file management commands work in one directory at a time. Sometimes this can be rather inefficient. For example, in DOS 5 and later you can type DIR *.TMP /S to list all of the files on the current drive that have the extension TMP. But you can't type DEL *.TMP /S to delete them, because the DEL command doesn't support the /S switch. Your only recourse is to delete the TMP files one directory at a time.

This month, we'll look at two methods to extend the reach of ordinary DOS commands. The first method involves a batch file; the second relies on a machine language program that you can create in a few minutes with DEBUG.

Clean Sweep Never underestimate the power of a good batch file. What follows is SWEEP, a tool to make any DOS command recursive. Use a text editor to create it, and name the file SWEEP.BAT:

```
@ECHO OFF
IF "%1"=="" GOTO ERROR
ECHO @CD %%2 >
C:\DOS\DIRECTOR.BAT
ECHO @%1 %2 %3 %4 %5 %6 %7 ↵
↳%8 %9 >> C:\DOS\DIRECTOR.BAT
DIR \/S | FIND "Directory" > ↵
↳C:\DOS\CMDLIST.TXT
ECHO EXIT >> C:\DOS\CMDLIST.TXT
COMMAND < C:\DOS\CMDLIST.TXT
DEL C:\DOS\DIRECTOR.BAT
DEL C:\DOS\CMDLIST.TXT
CD \
GOTO END
:ERROR
ECHO Syntax: %0 command
:END
```

It's simple to use: To delete every file on the default drive that has the TMP extension, type SWEEP DEL *.TMP.

SWEEP.BAT takes the command you type following the word SWEEP—in this case, DEL *.TMP—and executes it in every directory on the current drive. If C: is the default drive, then the command SWEEP DEL *.TMP does a DEL *.TMP in the root directory, in all of the subdirectories, in the subdirectories' subdirectories, and so on, until it has processed every directory on C:.

There are two things you should know about SWEEP.BAT. First, you must use DOS 5 or higher: SWEEP.BAT uses a DIR /S command, and earlier versions don't support the /S switch. Second, three commands inside SWEEP.BAT reference the file C:\DOS\DIRECTOR.BAT. It's not imperative that this file be stored in the \DOS directory of drive C:, but it's very important that it be stored in a directory named in your Path statement. If you don't have a C:\DOS directory, or it's not in your Path for some reason, edit the batch file to locate DIRECTOR.BAT in one of the directories identified by your Path environment variable.

How does it work? Lines 3 and 4 create a batch file named DIRECTOR.BAT, which contains two commands: one to change to the directory specified by the %2 parameter, and another to execute the command entered after SWEEP. If you started SWEEP by typing SWEEP DEL *.TMP, DIRECTOR.BAT would look like this:

```
CD %2
DEL *.TMP
```

Line 5 combines the DIR and FIND commands to create a new file named CMDLIST.TXT that contains a list of every directory on the current drive, like this:

```
Directory of C:\
Directory of C:\DOS
Directory of C:\WINDOWS
```

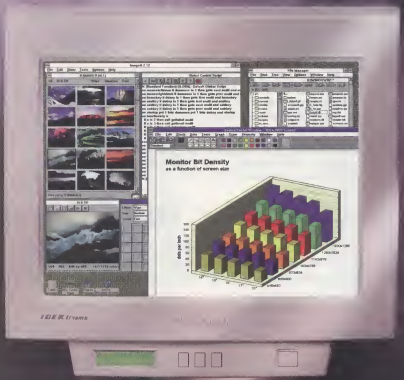
HOW TO DO IT — RE-CREATE OUR REPEAT UTILITY

This DEBUG script executes a command for every directory on a drive. Download SEPTIP.ZIP, which contains this script and others, from PC Contact's data library 2 (Hot Tips/Secrets). See page 250 for instructions.

```
N REPEAT.COM
E 0100 EB 5C 90 5C 00 43 4F 4D
E 0108 53 50 45 43 3D 00 00 00
E 0110 00 00 00 FF FF FF FF FF
E 0118 FF FF FF 53 79 6E 74 61
E 0120 78 3A 20 52 45 50 45 41
E 0128 54 20 63 6F 6D 6D 61 6E
E 0130 64 24 43 61 6E 6E 6F 74
E 0138 20 66 69 6E 64 20 43 4F
E 0140 4D 4D 41 4E 44 2E 43 4F
E 0148 4D 24 49 6E 73 75 66 66
E 0150 69 63 69 65 6E 74 20 6D
E 0158 65 6D 6F 72 79 24 FC BE
E 0160 81 00 AC 3C 20 74 FB 3C
E 0168 09 74 F7 3C 0D 75 0C BA
E 0170 1B 01 B4 09 CD 21 B8 01
E 0178 4C CD 21 B4 4A BB 00 10
E 0180 CD 21 BA 4A 01 72 EB C7
E 0188 06 0F 01 7F 02 8C 1E 11
E 0190 01 8B DE 4E 8F 83 02 AC
E 0198 AA 3C 0D 75 FA 88 CE 2B
E 01A0 C8 80 C1 03 88 0E 7F 02
E 01A8 BE 05 01 B9 08 00 8E 06
E 01B0 2C 00 E8 A9 00 BA 32 01
E 01B8 72 B8 BE 83 03 26 8A 05
E 01C0 47 88 04 46 0A C0 75 F5
E 01C8 C6 06 83 04 5C B4 47 32
E 01D0 D2 BE 84 04 CD 21 B4 3B
E 01D8 BA 03 01 CD 21 E8 13 00
E 01E0 B4 3B BA 83 04 CD 21 B8
E 01E8 00 4C CD 21 2A 2E 2A 00
E 01F0 2E 2E 00 55 BA 2F CD 21
E 01F8 53 06 83 EC 2B BB EC B4
E 0200 1A B8 D5 CD 21 52 B8 00
E 0208 4B BB 0D 01 BA 83 03 CD
E 0210 21 73 06 BA 32 01 E9 59
E 0218 FF B4 1A 5A CD 21 B4 4E
E 0220 B9 17 00 BA EC 01 CD 21
E 0228 72 25 80 7E 1E 2E 74 19
E 0230 F6 46 15 10 74 13 B4 3B
E 0238 8B D5 83 C2 1E CD 21 E8
E 0240 B1 FF B4 3B BA F0 01 CD
E 0248 21 B4 4F CD 21 73 DB 83
E 0250 C4 2B B4 1A 8C DB 1F 5A
E 0258 CD 21 8E DB 5D C3 FC 33
E 0260 FF 51 56 57 F3 A6 74 12
E 0268 5F 32 C0 B9 FF FF F2 AF
E 0270 5E 59 26 80 3D 00 75 E9
E 0278 F9 C3 83 C4 06 F8 C3 3F
E 0280 2F 43 20
RCX
183
W
Q
```

PC Contact

Awesome monitor. Killer price.



No monitor beats the 17" VisionMaster**					
	VISIONMASTER MF-8617	VIEWSONIC 17	VIEWSONIC 17G	NEC 5FGE	NEC 5FGP
SCREEN SIZE	17"FST	17"FST	17"FST	17"FST	17"FST
DOT PITCH	.26mm	.27mm	.28mm	.28mm	.28mm
MAX RESOLUTION	1280 x 1024	1280 x 1024	1280 x 1024	1024x 768	1280 x 1024
MAX. REFRESH @ 1280 x 1024	80Hz	76Hz	60Hz	N/A	76Hz
COLOR MATCHING	YES	YES	YES	NO	YES
POWER SAVING	YES	YES	YES	NO	YES
WARRANTY PARTS/LABOR	3YRS/3YRS	3YRS/1YR	3YRS/1YR	3YRS/3YRS	3YRS/3YRS
OPTIONAL EXTENDED	YES 2 YEARS	NO	NO	NO	NO
PRICE	$799	$1045	$945	$1155	$1455

VisionMaster 17" ONLY $799 MSRP

Three "plus" year warranty. 1280 x 1024 at 80 Hz. EnergyStar. Only VisionMaster packs $1,395 worth of performance into a $799 monitor.

This is a monitor to write home about. Every high-performance feature at an unheard of price—backed by the most aggressive warranty in the business. The new VisionMaster 17" FST.

3+ YEAR WARRANTY

It's all here. Precision .26 dot pitch and incredibly fast 80 Hz vertical refresh for crystal clear, flicker-free images. Microprocessor control to eliminate image distortion. An anti-glare coating to relieve eye strain. A base three year warranty that can be extended to five years. MPR II low-radiation certification. And a unique "power-off" energy conservation system that makes any PC that uses it EnergyStar compliant.

Compare these features. Compare our "three plus" warranty. No monitor beats the 17" VisionMaster for value and performance. Call today—they'll be going fast.

For more information or the reseller nearest you, call today at 1-800-313-IDEK.

VISIONMASTER™

IDEK Iiyama

Iiyama North America, Inc.
650 Louis Drive, Warminster, PA 18974
Outside the U.S., call 215-957-6543
Fax: 215-957-6551

*Three-year warranty on parts and labor when purchased through an authorized reseller
Windows is a registered trademark of Microsoft Corporation.
VisionMaster is a trademark and product of Iiyama North America.
©1994 Iiyama North America
**Prices and specifications accurate as of 6/1/94.

Circle 179 on reader service card.

SNAPSHOT INSTANT RECURSIVE SWITCH

Search and Destroy: What would you rather do, retype the same command over and over or opt for **REPEAT.COM** or SWEEP.BAT? Hint: We've boldfaced the right answer. By typing in the DEBUG script on the previous page and compiling it, you'll be able to run your commands everywhere, just as though they came with their own /S switch.

```
G:\>del \dos\*.tmp

G:\>del \windows\*.tmp

G:\>del \windows\system\*.tmp

G:\>del \winword\*.tmp

G:\>del \winword\doc\*.tmp


G:\>repeat del *.tmp
```

Line 6 appends an EXIT command to the end of the list. Line 7 is where the action occurs. It executes another copy of COMMAND.COM and, using an input redirection operator, instructs COMMAND.COM to take its commands from CMDLIST.TXT. Every line in CMDLIST.TXT that begins with Directory becomes a command that executes DIRECTOR.BAT. (DOS ignores the y at the end of Directory because command names are limited to eight characters. Clever, no?) As a result, the secondary copy of COMMAND.COM executes DIRECTOR.BAT once for every directory on the disk. DIRECTOR.BAT, in turn, changes to the corresponding directory (the C:\DOS in Directory of C:\DOS becomes %2 when DIRECTOR.BAT is executed), and executes the command you typed after SWEEP. It's convoluted, but it works.

Come Again? The trouble with batch files is that they're slow. They'll do when you don't have a real program to do the job, but why settle for less than a full-fledged DEBUG script? The script in "Re-create Our Recursive Utility," page 224, creates a stand-alone utility named REPEAT.COM that works like SWEEP, only better. Type it into your text editor and save it as REPEAT.SCR. Then type DEBUG<REPEAT.SCR to create it.

To delete all the TMP files from the default drive, type REPEAT DEL *.TMP. Note: If you attempt to reference a file that doesn't exist in every directory, you'll see a "File not found" message for every failed match. It's not really an error, just a notification that there were no TMP files in some directories.

REPEAT is a machine language program that I wrote with the Microsoft Macro Assembler. It avoids all of the overhead associated with a batch file. Better still, it works on *any* PC that runs DOS 3.0 or later, and it doesn't rely on hard-coded filenames like C:\DOS\DIRECTOR.BAT. It's a general-purpose tool that you don't need to adapt to individual PCs.

If REPEAT displays the error message "Cannot find COMMAND.COM," check your COMSPEC environment variable. Either it doesn't exist, or it points to a copy of COMMAND.COM that's no longer there. Another possible error message is "Insufficient memory." REPEAT requires about 64K of free memory, and it terminates with this message if there is less than that amount available.

These two solutions just go to show you that you should never give in to DOS's shortcomings. JEFF PROSISE

JEFF PROSISE *is not only your DOS guru, he's also the author of* Windows Desktop Utilities *(ZD Press, 1994).*

PC Contact XTREE REBORN

4FILES
Down because XTree is dead? Try 4FILES, an XTree-like file-management utility. Copy, move, delete, rename, and even annotate directories and files. The 4FILES utility works well with COMMAND.COM replacements such as the NDOS that comes with Symantec's Norton Utilities. You can even use it as a compression front end. Download 4FILES.ZIP from PC Contact's data library 3 (Utilities/Misc.). See page 250 for information on ordering the disk from Public Brand Software.

DOS TIPS

SUB-SUB-SUBDIRECTORY

Problem: *Creating several nested subdirectories requires typing the MD command over and over.*

Solution: Here's XMD, the Extended Make Directory command that eliminates the need for repeating MD. To create XMD, type the following DEBUG script into your text editor and save it as XMD.SCR:

```
N XMD.COM
E 0100 FC BE 81 00 AC 3C 20 74
E 0108 FB 3C 2C 74 F7 4E 3C 0D
E 0110 75 0C BA 85 01 B4 09 CD
E 0118 21 B8 01 4C CD 21 56 AC
E 0120 3C 20 74 08 3C 2C 74 04
E 0128 3C 0D 75 F3 4E C6 04 5C
E 0130 8B DE C6 44 01 00 5E 56
E 0138 80 3C 5C 75 04 46 EB 12
E 0140 90 46 80 3C 3A 75 0A 46
E 0148 80 3C 5C 75 05 46 EB 02
E 0150 90 4E AC 3C 00 74 28 3C
E 0158 5C 75 F7 4E C6 04 00 8B
E 0160 CE 5E 51 B4 39 8B D6 CD
E 0168 21 73 0A 59 3B CB 75 06
E 0170 BA A0 01 EB A0 59 56 8B
E 0178 F1 C6 04 5C 46 EB D3 5E
E 0180 B8 00 4C CD 21 53 79 6E
E 0188 74 61 78 3A 20 58 4D 44
E 0190 20 5B 64 72 69 76 65 3A
E 0198 5D 70 61 74 68 0D 0A 24
E 01A0 55 6E 61 62 6C 65 20 74
E 01A8 6F 20 63 72 65 61 74 65
E 01B0 20 64 69 72 65 63 74 6F
E 01B8 72 79 0D 0A 24
R CX
BD
W
Q
```

Type DEBUG<XMD.SCR to create XMD.COM. To create the directory structure C:\DATA\93-94\PAYROLL, for example, type XMD \DATA\93-94\PAYROLL.

ROGER W. SAUER
FAIRFIELD, CALIFORNIA

TIME'S UPDATE

Problem: *You need to update the date/time stamp on all of the files in a directory.*

Solution: Create the following batch file and name it UPDATALL.BAT:

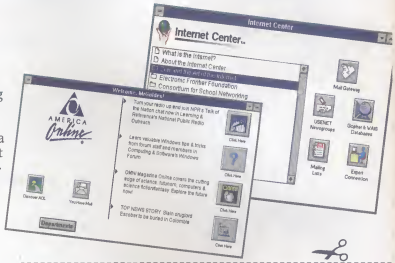
```
@ECHO OFF
FOR %%A IN (*.*) DO COPY /B
%%A +, > NUL
```

To use it, just type UPDATALL

America Online: It's So Good, It's Free.

An Exciting New World of Computing is Just Two Snips Away.

Clip and return this coupon, and we'll send you — absolutely free — everything you need to start using America's most exciting online service: America Online. We're so sure you'll love America Online, we'll give you the software you need to get started, a free trial membership, and free connect time so that you can explore this fascinating new world of information, computing support, entertainment, and personal enrichment.



Easy To Use, Yet Powerful.

A unique point-and-click environment lets you navigate through America Online's many services quickly and efficiently. You'll be an expert in no time.

Get fast answers from hardware and software developers, reviewers, and computing experts. Scan for objective reviews on thousands of computing products. Browse software libraries filled with thousands of programs you can choose and use offline. Novice or pro, America Online will enhance your computing experience.

You'll profit from America Online in other ways, too. Send and receive electronic mail with ease. Get nightly homework help for the kids. Manage your investments. Get the latest news and weather. Join special interest groups and clubs. Save time and money shopping. Find and book the lowest airfares. Entertain yourself with games, quizzes, movie and book reviews, horoscopes, soap opera news, and much more.

Don't Delay — Order Your Free Software Now!

Find those scissors, clip the coupon, and get ready to enter an exciting new world of computing.

Clip and mail the card or fax it to 1-800-827-4595.

Hurry! Respond By 9/30/94

FREE TRIAL! FREE SOFTWARE!

❑ **YES!** Send me the free software and trial membership. I understand there's no risk—if I'm not completely satisfied, I may cancel without further obligation.

NAME

ADDRESS

CITY

STATE ZIP

( )
HOME PHONE

SELECT DISK TYPE AND SIZE —

Windows*: ❑ 5.25 ❑ 3.5

DOS: ❑ 5.25 ❑ 3.5 ❑ High Density ❑ Low Density

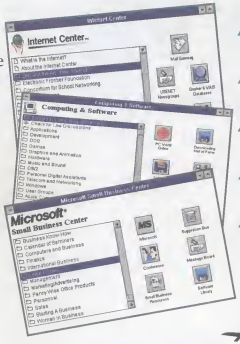
*To use America Online for Windows, you must have a 386 PC or higher, 4MB of RAM, a VGA monitor, a mouse, a modem, and a working copy of Windows 3.1.

Use of America Online requires a major credit card or checking account. Limit one free trial per household. America Online is a registered service mark of America Online, Inc. Other names are trademarks or service marks of their respective owners.

3971/W

How Many of These America Online Services Could You Use — Right Now?

- Internet Center
- More than 100,000 Software Files and Programs
- Fast, Easy Downloading
- Searchable Online Encyclopedia
- Powerful Electronic, Fax, and U.S. Mail Capabilities
- Stock Quotes and Portfolio Management



- Multi-Player Graphic Games
- Special Interest Groups and Clubs
- Microsoft® Small Business Center
- Graphic Windowing Interface
- Homework Help and Tutoring Sessions

Clip and mail the card or fax it to 1-800-827-4595.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 8009 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

AMERICA Online

8619 Westwood Center Drive
Vienna, VA 22182-9806

Hurry! Respond By 9/30/94
FREE TRIAL!
FREE SOFTWARE!

❑ **YES!** Send me the free software and trial membership. I understand there's no risk—if I'm not completely satisfied, I may cancel without further obligation.

NAME

ADDRESS

CITY

STATE ZIP

( )
HOME PHONE

SELECT DISK TYPE AND SIZE —

Windows*: ❑ 5.25 ❑ 3.5

DOS: ❑ 5.25 ❑ 3.5 ❑ High Density ❑ Low Density

Clip and mail to: America Online
8619 Westwood Center Drive
Vienna, VA 22182

*To use America Online for Windows, you must have a 386 PC or higher, 4MB of RAM, a VGA monitor, a mouse, a modem, and a working copy of Windows 3.1.

Use of America Online requires a major credit card or checking account. Limit one free trial per household. America Online is a registered service mark of America Online, Inc. Other names are trademarks or service marks of their respective owners.

3971/W

in the directory that contains the files you wish to update.

Saul P. Morse
Orlando, Florida

COUNT DIRECTORIES

Problem: *There's too much junk on your hard disk. You'd like to find out at a glance how many directories you have.*

Solution: Using your favorite text editor, create DIRNUM.BAT and place it in a directory that's in your Path statement:

```
@ECHO OFF
ECHO Checking number of ↵
↳directories ...
CHKDSK | FIND *dir*
```

You can run DIRNUM on any hard disk or floppy disk, but it won't work at all on a network drive.

Saul P. Morse
Orlando, Florida

GETTING ANSI

Problem: *Batch files often require ANSI.SYS to be loaded.*

Solution: Create a small utility to determine whether ANSI.SYS is available, and use it in your batch file. Type the following DEBUG script in your text editor and save it as ANSITEST.SCR:

```
N ANSITEST.COM
E100 B8 00 1A CD 2F FE C0 B4
E108 4C CD 21
RCX
B
W
Q
```

Type DEBUG<ANSITEST.SCR to create ANSITEST.COM. This utility returns an ERRORLEVEL 0 if ANSI.SYS is active, and ERRORLEVEL 1 if it's not running. Here's an example of a batch file utilizing ANSITEST:

```
@ECHO OFF
ANSITEST
IF ERRORLEVEL 1 GOTO INACTIVE
ECHO ANSI.SYS ACTIVE
GOTO END
:INACTIVE
ECHO You must load ANSI.SYS first
:END
```

Lee A. Floyd
Morrow, Georgia

DOUBLESPACE BOOST

Problem: *The old bottleneck, your hard disk, is working even slower since you've compressed it with DoubleSpace.*

Solution: Configure DoubleSpace to take advantage of your 386 or 486 processor's capabilities. To locate the uncompressed drive containing the compressed file DBLSPACE.000, type DBLSPACE/INFO. Go to the root directory of that drive and type:

```
ATTRIB -H -R -S DBLSPACE.INI
```

Then type EDIT DBLSPACE.INI, and add the following line:

```
Enable386=1
```

Save, exit, and at the prompt type:

```
ATTRIB +H +R +S DBLSPACE.INI
```

Reboot for the changes to take effect. The speed improvement won't be dramatic, but every little bit helps.

Aaron Sethman
Bentleyville, Pennsylvania

CLEVER BACKUP

Problem: *You don't want to back up your system daily, only when there are enough new files on the hard disk.*

Solution: Create a batch file to count all new files, based on the Archive bit, set at the time of the BACKUP or XCOPY commands. Name the batch file NEWBAKS.BAT.

```
@ECHO OFF
CLS
REM NOTE: IN THE NEXT LINE, ↵
↳TYPE AN EXTRA SPACE AT THE ↵
↳END.
CHOICE/C:YN Do you want to count↵
↳files that need to be backed up
IF ERRORLEVEL 2 GOTO END
IF ERRORLEVEL 1 GOTO DOIT
:DOIT
CLS
ECHO COUNTING....
DIR C:\*.* /AA /S>BU
TYPE BU|FIND /C '.'>>BU
ECHO new files to backup>>BU
CLS
ECHO There are
TYPE BU
PAUSE
:END
```

Save NEWBAKS.BAT in a directory that's in your Path statement, and add the line CALL NEWBAKS to your AUTOEXEC.BAT file following the PATH line. Note: This batch file works only in DOS 6.x.

Randy Christiansen
Stansbury Park, Utah

STARRY-EYED EDIT

Problem: *EDIT always defaults to *.TXT when you select File, Open.*

Solution: Before you start, make a copy of QBASIC.EXE, to be safe. Then rename QBASIC.EXE to QBASIC.BIN and type DEBUG QBASIC.BIN to start DEBUG and load QBASIC.BIN. Type R DS to display the value in register DS and add 2000 (hex). For example, if DS equals 0DAA, the value you want is 2DAA. Type E *xxxx*:DD70 '*.*',0 where *xxxx* is a value computed by adding 2000 to register DS. Type W, press Enter, type Q, and press Enter to save the edited file and quit DEBUG. Then rename QBASIC.BIN to QBASIC.EXE. This procedure applies only to MS-DOS 6.x.

Jeff Prosise
Contributing Editor

HOT TIP SKIP TWO DIRECTORIES

Problem: There's no quick way to "skip up" two or more directory levels.

Solution: You can type CD.. to move up one level, but two levels require two separate commands. Novell NetWare users are familiar with CD... or CD.... for quick tree navigation, but DOS doesn't provide that shortcut. Create a DOSKEY macro to do that by adding the following lines to your AUTOEXEC.BAT or macro batch file:

```
DOSKEY CD...=CD..$TCD..
DOSKEY CD....=CD..$TCD↵
↳..$TCD..
```

To use these macros, type CD... to skip up two levels, or CD.... for three levels.

KEN JOHNSON
OAK PARK, ILLINOIS

OPERATE YOUR PC FROM A REMOTE SITE

The Next Best Thing to Telekinesis

You planned it well. You really did. You took a disk home with all the files you needed in order to finish that nagging project at home over the weekend. It's Saturday afternoon and you start working, when you realize that a crucial file is missing. And the office is 55 miles away. You knew the day would come when you would get to use the remote access software the MIS people had you install. You launch the program and as you listen to the modem's dial tone, you think to yourself that technology is great and life is beautiful. But alas, you don't make the connection. Hmm. That's odd. You double-check the number, change the configuration, and retry. No connection. And then it hits you: Your office PC is not on!

Remote access software is a splendid idea, but its main drawback is that you need to leave the host system on at all times, which is bad for the environment and not so pleasant for your checkbook, either. Also, security-wise, it may not be advisable to leave a system on in your absence, as prying co-workers may be able to read your e-mail and access your files. Fortunately, there's a solution. Server Technology's Remote Power On/Off +Aux is a device that sits between your PC and the phone line, and wakes up your system when you dial in. If your modem shares a line with an answering machine or fax, there's an auxiliary port that detects the incoming call and routes it to the appropriate device. A utility called Listen, sold separately, speeds the boot-up process.

Now that you're finally connected, keep some guidelines in mind:

• Light use. Tempting as this may sound, don't use the remote system for regular operations, such as running the accounting program, managing records in a database, or crunching numbers. You'll find yourself twiddling your thumbs, waiting for things to happen. Remote access software is best used for downloading files, checking messages, and similar tasks.

• Use DOS. A GUI environment such as Windows can slow you down. If the operation you're attempting (such as downloading files) can be done from a DOS prompt, it'll go faster. Look for remote access programs that support both DOS and Windows. For example, Symantec's Norton pcAnywhere for Windows lets you choose from among such connections as Windows to Windows, Windows to DOS, and so on.

• No saver. Before you leave the office, turn off the screen saver on your host system. Some remote access programs won't let you deactivate screen savers.

• Local e-mail. Running your e-mail software from your local system will reduce your connect time. This way, you'll only need to load your data files (that is, the messages themselves) while online.

• Auto-activate. Obviously, if you're using a remote power-on device, you'll need to add a line to your AUTOEXEC.BAT file to activate the remote access software at boot-up.

• Practice passwords religiously. A remote access setup (especially with the remote power-on option) makes your system vulnerable to anyone with a modem.

• Fast modems. For the best overall results, get the fastest modems you can find. Look for a modem with a Data Terminal Equipment (DTE) rate that exceeds 57.6Kbps on 14.4Kbps modems and 115.2Kbps on V.34 class units. **YAEL LI-RON**

Remote Power On/Off +Aux / Server Technology / (800) 835-1515 / $169.95 / *Reader Service No. 687*
The Listen utility ($15.95) is not sold in stores. It may be purchased by calling Server Technology directly.
For the uninitiated, here are some suggestions for remote access programs:
Norton pcAnywhere / Symantec Corp. / (800) 441-7234 / $199 / *Reader Service No. 688*
Carbon Copy / Microcom / (800) 822-8224 / (617) 551-1000 / $199 / *Reader Service No. 689*
ReachOut Remote Control Pro / Ocean Isle Software / (800) 677-6232 / $199 / *Reader Service No. 690*

TIPS WORD PROCESSORS

WORDPERFECT 6.0

Problem: *You want to see what's in a ZIPped file.*

Solution: Select File, Open, single-click on any ZIP file, and select View. The Viewer window will display the contents of the ZIP file, as if you've typed PKUNZIP *filename* -V at the DOS prompt.

RON WHITE
SENIOR CONTRIBUTING EDITOR

WORDPERFECT 5.1 FOR DOS

Problem: *You want each page of a document to have the same border.*

Solution: Place a border in your header. Create a header by pressing Shift-F8 and selecting Page, Header A, Every Page. Insert an empty figure box by pressing Alt-F9 and selecting Figure, Create. Now set the "Wrap Text Around Box" option to No. Select Size, Set Both, and specify 6.5 by 8 (or whatever size you want). If you want the border to be larger than the default 1-inch margins allow, set your margin codes before you insert this figure box. Press F7 once to exit the Figure Box menu, and twice more to exit the Format menu. You will not see the box unless you preview the document. If you want the border to look like something other than a single thin line, set the Figure Options before you create the box (Alt-F9, Figure, Options).

JUDY HOUSMAN
CAMBRIDGE, MASSACHUSETTS

Problem: *You've created a table box, and now you need to change it to a figure box.*

Solution: This can be a headache if your box options are set for a figure box. To change the box type, edit the table box by

POWERLOOK™

It Beats Other Flatbed Scanners. Like A Drum.

To get a true picture of the most remarkable breakthrough in what color flatbed scanners can do, take a PowerLook.

The PowerLook from UMAX® delivers true 3.0 Dynamic Range, in one-pass, with resolution so sharp, you'd swear it was a drum scanner. But unlike a drum scanner, this 1200 x 1200 dpi* flatbed costs less than $3,500.

PowerLook is teamed with MagicScan™– the ultimate intuitive user interface. Its advanced features like batch-scanning, descreening and auto-exposure are designed to save you time. You also get a whole complement of image and production tools, including color balancing, negative-to-positive image inversion, auto-scaling and much, much more that gives you "The Magic of Color" in every image.

PowerLook is virtually maintenance-free given its unique modular design that separates optical, electrical and transmission subsystems. And by utilizing a cold cathode lamp and sealing the optics, the PowerLook is completely particle-free as well.

PowerLook's breakthrough technology separates the analog and digital signals, dramatically reducing noise levels, giving you sharper, cleaner and higher quality color images at speeds so fast you'll take a second look.

MagicScan offers Auto-Adjustments and Previews that optimize user control and productivity.

Built-in SCSI II interface and TWAIN compliance means the PowerLook can be used in just about any environment. And, with 30-bit color, you have the freedom to manipulate images exactly the way you want them to look.

To give you even more control of your images, the PowerLook includes today's leading image editing and color separation software and a Transparency Adapter for any type of pre-press application. You know, the ones you currently "farm-out" to the service bureau.

So if you'd like to get your hands on the flatbed scanner that beats other flatbeds cold, beat a path to the phone and call us at: **1-800-562-0311**

UMAX®

The Magic of Color™

Circle 257 on reader service card.

* 2400 x 2400 dpi can be achieved through interpolation with UltraView™ © 1994 UMAX Technologies, Inc. 3353 Gateway Blvd., Fremont, CA 94538. 510-651-8883 • Fax 510-651-8834 • Toll Free 1-800-562-0311. UMAX is a registered trademark of UMAX Data Systems, Inc. "The Magic of Color," PowerLook, MagicScan and UltraView are trademarks of UMAX Technologies, Inc. Other company names and product names are trademarks of their respective companies.

pressing Alt-F9 and selecting Table, Edit, and typing the box number. When in the Table Box menu, press Alt-F9 again and select Figure.

NORMA AIELLO
SANTA FE, NEW MEXICO

Problem: *Whether you like it or not, tables always get a double border, and you constantly have to change them to your preferred border style.*

Solution: Set a default border as follows: Press Shift-F1, and select Initial Settings, Initial Codes. In the Initial Codes screen, press Shift-F8, select Other, Border Options, Double. Press Enter on Width and Shading, and type 0 for Spacing Between. Press F7 twice to exit the Setup menu. Next time you create a table, it will display with a double border, but when you preview or print it, the line will be single. Note that this default will apply to graphic boxes as well, so if you use double borders for figure boxes, you'll need to change the border type manually each time.

NORMA AIELLO
SANTA FE, NEW MEXICO

MICROSOFT WORD 6.0

Problem: *You want to open a document as soon as you load Word for Windows.*

Solution: This macro presents you with three options at startup: Open last used, open any file, or create a new file. To create the macro select Tools, Macro, type AutoExec for the macro name, and select create. Type the following lines between the Sub MAIN and End Sub lines, and press Ctrl-W to save it:

```
Sub MAIN
Begin Dialog UserDialog 320, ↵
↳144, "Startup Options "
PushButton 53, 21, 250, 21, ↵
↳"Open " + FileNameInfo$(File ↵
↳Name$(1), 3)
PushButton 53, 55, 250, 21, ↵
↳"Open Another Document"
PushButton 53, 93, 250, 21, ↵
↳"Create a New Document"
End Dialog
Dim MyDialog As UserDialog
Button = Dialog(MyDialog)
Select Case Button
Case 1
File1
Case 2
Dim fo As FileOpen
GetCurValues fo
fo.Name = "*.*"
On Error Goto UserClickedCancel
Dialog fo
On Error Goto 0
FileOpen fo
ViewZoomPageWidth
UserClickedCancel:
Case 3
FileNewDefault
Case Else
End Select
End Sub
```

Because this is an AutoExec macro, it will auto-execute as soon as you launch Word.

WOODY LEONHARD
CONTRIBUTING EDITOR

TIPS SPREADSHEETS

MICROSOFT EXCEL 5

Problem: *You need an efficient data entry method that includes a validation tool.*

Solution: Use the Excel custom controls to create a spinner button, as follows: Right-click on the toolbar and select Forms. From the floating Forms toolbar, click on the spinner button (it looks like a double-edged arrow). Next to the cell that holds the data entry you wish to control, drag and draw a vertical rectangle to place the spinner button. Right-click on the button and select Format Object, then click on the Controls tab. Set the minimum, maximum, and increments for the cell's value, and type the cell's address in the Cell Link box. Click on the Properties tab and select Move and size with cells. Whenever you click on the up or down arrow of the spinner button, the linked cell's value will change according to the increment you specified in Controls.

RICK DOBSON
LOUISVILLE, KENTUCKY

Problem: *You want to sum cells in a range, but only if they meet your criteria.*

Solution: The SUMIF function computes sums of records in a list or database that meet specified criteria. Suppose you have an Excel spreadsheet listing the names and annual salaries of your department's 180 employees in the range A2:B181. To compute the aggregate annual compensation paid to employees making more than $50,000 annually, you need a formula that adds only the amounts in column B that exceed $50,000. The following formula computes the desired result:

```
SUMIF(B2:B181,">50000").
```

You may want to specify criteria in a field other than the value field. If, for instance, column C contained job description codes, you could compute total annual compensation for all employees in job classification 103 with the following formula:

```
SUMIF(C2:C181,103,B2:B181)
```

The first argument tells Excel to search column C for the value specified in the second argument. The optional third argument tells Excel where to find the values to include in the computed total. If your criterion is

HOT TIP WORD FOR WINDOWS

Problem: You can only insert one row at a time in a Word 6.0 for Windows table.

Solution: If you block a specific number of rows and select Insert Rows from the Table menu, you'll insert the same number of rows you have blocked. But here's a more elegant solution: Write a macro to prompt you for the number of rows you wish to insert. To create the macro, select Tools, Macro, type InsertTableRows for the name, and select Create. Type the following lines between the Sub MAIN and End Sub lines, and press Ctrl-W to save:

```
Sub MAIN
row$ = InputBox$("Number of ↵
↳Rows to Add:", "Add Rows")
TableInsertRow .NumRows =↵
↳row$
End Sub
```

CHRIS SANDLUND
ASSOCIATE EDITOR

WE BEAT THE PANTS OFF OUR COMPETITION.

NOW WE'RE GOING TO KNOCK YOUR SOCKS OFF!

$495
LIMITED OFFER
$99

AT&T PRESENTS RIO 6.3 - THE FASTEST, EASIEST, MOST POWERFUL GRAPHICS SOFTWARE IN THE WORLD.

For almost a century, AT&T has provided **INNOVATIVE** technology designed to help you communicate. With the new RIO 6.3, AT&T gives graphic artists and corporate users **POWERFUL** drawing tools to communicate their ideas with ease. We're talking about features that you can use to produce the kind of graphics commonly seen on television. Imagine automatically generating a shadow for any text or object and controlling the light source, intensity, and drop. How about adding filters such as emboss, posterize, and soften to vector images – this is **THE BEST** of drawing and paint programs combined! Its ability to morph and envelope text is **UNSURPASSED**. We've even included 250 high-quality PostScript fonts to get you started. All this power and lightning **FAST** too, that's how we beat the pants off our competition. • The list of features goes on, but the best feature right now is our unprecedented offer. The first 50,000 respondents can purchase RIO 6.3 for only $99. RIO normally sells for $495...whoa! Better yet, you can try it **FREE** for thirty days! When you see RIO perform, and experience how **EASY** this graphic powerhouse is to use, it'll knock your socks off! So call now and order your copy to use for **FREE**.

- Over 250 PostScript Type-1 fonts
- Has the best of draw (vector) and paint (raster) programs
- Text enveloping & fit text to paths
- 24-bit interactive display
- Emboss, pixelize, posterize, soften, negative, & grayscale
- Map images and textures to any shape or text
- Object and text blending
- Multi-color radial and linear gradient fills

AT&T

CALL 1-800-251-2185

Circle 145 on reader service card.

a text value or includes a comparison operator, such as > or =, enclose the criteria description in quotes, or Excel will not accept the formula.

RALPH SOUCIE
JONESPORT, MAINE

Problem: *There's no obvious way to move columns in a table without using a mouse.*

Solution: This tip is very useful for users of portable computers. Tab over to the column you wish to move. Press Ctrl-space bar to select the entire column, and press Ctrl-F8. Notice that the word MOV appears on the status bar. Use the arrow keys to move the column to a new location. When you're finished, press Esc to turn off MOV mode.

SHANE DEVENSHIRE
WALNUT CREEK

QUATTRO PRO 5.0 FOR WINDOWS

Problem: *You need to print several non-contiguous blocks.*

Solution: When you specify the print block, separate the different blocks with commas. For example: A:C5..F25,M:D2..F12. If you've named your sheets and/or blocks, refer to these names in that statement. If you're not sure what the blocks are, you can use the point-and-click method by blocking the first print block, then Ctrl-blocking each additional block. You'll need to preblock before going to the Print menu.

NORMA AIELLO
SANTA FE, NEW MEXICO

TIPS DATABASES

MICROSOFT ACCESS 2.0

Problem: *You need a stopwatch function for timing activities.*

Solution: Create a form with two command buttons in the Detail Section—one called Start, the other, Finish. These buttons can be created by dragging and dropping the Command Button object from the Toolbox. Make sure you have two fields in your table called Display and Seconds. Display is a Long Time Field that displays the start and finish time. Seconds is an Integer Field that displays the total time of an event. Next, select Design, Form, View and add an Event Procedure to the Start button by following these steps:

Right-click on the command button and select Properties. Right-click on Event Procedure, and select Build. Then just type the following lines between the Sub and End Sub statements:

```
Time = "0:00:00"
Display = Time
```

To create the Finish button, add an Event Procedure by typing the following lines between Sub and End Sub:

```
Display = Time
Seconds = (3600 * Hour(Display))
+(60 * Minute(Display)) +
Second(Display)
```

JUDY JONG
SAN FRANCISCO, CALIFORNIA

BORLAND DBASE IV

Problem: *You want users of your programs to be shielded from dBASE IV's cryptic error messages.*

Solution: Create an error procedure that you control with the ON ERROR command. The ErrorScr procedure shown below not only displays information pertaining to the error, but does some cleanup and plays a familiar "error tune" as well ("Taps"). The command

```
ON ERROR DO ErrorScr WITH
PROGRAM(),LINENO()
```

identifies ErrorScr as the procedure to perform in case of error. Passed as parameters, PROGRAM() and LINENO() will return the name and line number of the calling program, rather than the error procedure itself.

```
PROCEDURE ErrorScr
PARAMETERS err_p,err_l
SET TALK OFF
ON KEY
CLOSE DATABASES
CLEAR TYPEAHEAD
SET DEVICE TO SCREEN
SET CONSOLE ON
SET CURSOR ON
DEFINE WINDOW ErrorWin ;
FROM 6,14 TO 18,64 NONE
COLOR W+/R
ACTIVATE WINDOW ErrorWin
@ 0,16 SAY "E R R O R T R A P"
@ 1,16 SAY "- - - - - - - - -"
@ 3, 1 SAY "An error has occurred."
+;
" Please contact the system"
@ 4, 1 SAY "administrator and
report" +;
" the following:"
@ 6, 1 SAY "ERROR#: " +
LTRIM(STR(ERROR()))
@ 7, 1 SAY "MESSAGE: " +
LEFT(MESSAGE(),41)
@ 8, 1 SAY "PROGRAM: " + err_p
@ 9, 1 SAY "LINE#: " +
LTRIM(STR(err_l))
SET BELL ON
SET BELL TO 500,8
?? CHR(7)
SET BELL TO 720,6
?? CHR(7)
SET BELL TO 900,8
?? CHR(7)
SET BELL TO
@12,12 SAY "Press a key to
continue..."
?? INKEY(0)
DEACTIVATE WINDOW ErrorWin
RETURN TO MASTER
```

ROGER W. SAUER
FAIRFIELD, CALIFORNIA

HOT TIP MICROSOFT EXCEL 5

Problem: Dollar signs don't align properly when you use the Currency format.

Solution: Instead of using a regular Currency format, apply one of the Accounting formats. Block the range you wish to format, right click and select Format. Select Accounting, and choose the first or third Accounting formats. Alternatively, if you wish to add double underlines, extended underlines, or other effects, select the Accounting Autoformat, as follows: Select Format, Autoformat, and select one from those labeled "Accounting 1" through "Accounting 4."

RALPH SOUCIE
JONESPORT, MAINE

TIPS REMOTE CONTROL

CENTRAL POINT COMMUTE

Problem: *You want a faster way to dial in and take control.*

Solution: Set up the host (or hosts) you want to control with the Call in and take control option. Then create a batch file to activate Commute for each. For example, say your list includes Chicago. Write a batch file called CHICAGO.BAT that includes the following lines:

```
@ECHO OFF
COMMUTE CHICAGO
```

The advantage of this method is that you don't have to go through the Commute menus. Just type CHICAGO at the DOS prompt and you will dial the correct number.

SHERRY GORDON
FLAGSTAFF, ARIZONA

NORTON-LAMBERT CLOSE-UP

Problem: *Close-Up takes up too much memory when you run it.*

Solution: It's relatively simple to trim Close-Up's requirements. Run the CHOST command with the SMALL BUFFERS=S parameter. That pushes you from a default of about 81K down to about 47K. If you want to run CHOST with a memory manager, you need to reduce its disk size before you load it. Just type CHOST EXTRACT SMALL in the Close-Up directory, and you'll produce a version of CHOST called CHOSTS.EXE that's about 55K (compared to the default of about 260K).

JEF RAND
SAN MATEO, CALIFORNIA

Problem: *Switching between the host's DOS prompt and yours confuses you.*

Solution: Set the prompts to identify the systems. At each prompt, type PROMPT OFFICE SYSTEM$_$p$g and PROMPT MY SYSTEM$_pg for Host and Local, respectively.

SHERRY GORDON
FLAGSTAFF, ARIZONA

CARBON COPY FOR WINDOWS

Problem: *Using Microcom Carbon Copy for Windows via remote access is too slow.*

Solution: Here are four things to do to make it faster. First, remove the Wallpaper from the host by selecting Main, Control Panel, Desktop. Wallpaper is a bitmap and takes a long time to download. Second, minimize your use of colors—these also take a long time to transfer. Configure the host computer to use a 16-color driver in Windows. Third, don't use any screen savers on the host PC—they use valuable Windows resources and CPU processing time. Finally, reduce the number of open groups to only those you need to access; that way, Carbon Copy for Windows does not need to transmit superfluous information. By the way, these four tips work with any remote access product.

SHERRY GORDON
FLAGSTAFF, ARIZONA

HOT TIP COMMUTE

Problem: Central Point Commute initializes the modem, but shortly thereafter gives "Modem Error 254."

Solution: This problem could occur if the COMMUTE.CFG file is corrupt or an incorrect COM port, baud rate, or modem initialization string has been selected. From the Configure menu, verify the COM port, baud rate, and modem selected. Then rename the COMMUTE.CFG file, run Commute, and reconfigure the program. If neither of these works, add the following to your initialization string: E0V0. E0 turns off local echo, V0 sends modem responses as numbers, not letters.

JOHN TASCHEK
ASSOCIATE TECHNICAL EDITOR

FREE CATALOG!

Five Reasons To Shop Inmac For Your PC Hardware And Software

1. **Low Prices** On Every Product, Every Day.
2. **Largest Selection** Of PC Hardware And Software Available.
3. **Satisfaction Guaranteed** With Inmac's 30-Day Warranty.
4. **Fast Shipment** Call By 5 p.m. And It's Shipped The Next Day.
5. **Easy Ordering** Just Pick Up The Phone And Call Toll-Free.

CALL TOLL FREE
1-800-972-9240

Or FAX 1-800-972-3210, 24 Hours A Day

YES! Please reserve my FREE copy of the INMAC PC Select Catalog.

Your Name Title
Company # of employees at your company
Division/Mailstop/Suite #
Address
City State Zip
Area Code Day Phone

Mail To: Inmac, 2465 Augustine Drive Santa Clara, CA 95052

Priority Code S940906 inmac

Help APPLICATION TIPS: Run pcAnywhere with Windows for Workgroups • Lighten LapLink's Load

SYMANTEC NORTON PCANYWHERE

Problem: *You're trying to use pcAnywhere with an external modem, but you get erratic results.*

Solution: Assuming that it's a supported modem, you could be having cable problems. Norton pcAnywhere is harder on modems and cables than other programs are, so there are a couple of things to look at. Be sure that you are not using any 9- to 25-pin adapters on the cable because they won't pass enough lines through for pcAnywhere to work properly.

SYMANTEC
PRODUCT SUPPORT

Problem: *You want to run pcAnywhere with Windows for Workgroups.*

Solution: Technically, it's not supported—some of the 32-bit VxDs cause problems. But of course it's possible: You will need the Windows for Workgroups DOS client software from Microsoft. Next, load pcAnywhere, then load the DOS client software, and you'll have a link to the network before you enter Windows for Workgroups.

SYMANTEC
PRODUCT SUPPORT

Problem: *Symantec's Norton pcAnywhere locks up.*

Solution: So do a lot of programs. However, you might be running out of resources. Edit CONFIG.SYS and make sure that FILES=50 and BUFFERS=30,*n* where *n* is not zero. Also make sure that your COMMAND.COM line has the /E:1024 parameter (at least). You may also want to try reducing the size of the disk cache to see whether that helps—change the SMARTDRV line in AUTOEXEC.BAT to use less memory (change 2048 to 1024, for example). Finally, be sure that you have a TEMP= statement in AUTOEXEC.BAT and that it points to a valid directory on a drive that is noncompressed.

DAN DOHAN
SAN JOSE, CALIFORNIA

TRAVELING SOFTWARE LAPLINK

Problem: *LapLink Remote Access's TSRs take up too much memory.*

Solution: First load them high. Instead of calling LLRA.BAT, create a batch file with the following lines:

```
LH C:\COMMWORK\LLRA\LLRA1.EXE
LH C:\COMMWORK\LLRA\LLRA2.EXE
LH C:\COMMWORK\LLRA\LLRA3.EXE
```

If you're not using a modem, or if your modem has built-in compression, don't bother to load LLRA4.EXE, the compression module. You'll save about 20K of memory. Just so you know, modems that have V.42bis, MNP 5, and MNP 7 all have built-in compression.

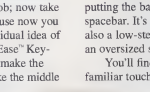
TRAVELING SOFTWARE
TECHNICAL SUPPORT

Now more than ever, adjusting to your work is entirely up to you.

You take control of your job; now take control of your keyboard. Because now you can adjust it to your own individual idea of comfort–with the new Select-Ease™ Keyboard from Lexmark. You can make the back higher than the front. Make the middle higher than the sides. Rotate the two halves–or even separate them entirely.

We've made erasing more comfortable, too, by putting the backspace key right next to the spacebar. It's called Erase-Eaze.™ There's also a low-stepped profile, palm rests and an oversized spacebar.

You'll find this keyboard has the same familiar touch as IBM® keyboards. Which is no surprise, since we've made IBM keyboards for many years, first as an IBM division and now as an independent company. In fact, today we're one of the world's largest keyboard manufacturers.



To order the Select-Ease Keyboard from Lexmark for just $179, call 1-800-438-2468. For the name of your nearest dealer, call 1-800-358-5835.

LEXMARK™
Make Your Mark

In Europe, call (33) 1 41 16 93 57. IBM is a registered trademark of International Business Machines Corporation in the United States and/or other countries. Lexmark and Select-Ease are trademarks of Lexmark International, Inc. Erase-Eaze is a trademark of Keyboard Advancements, Inc. ©1994 Lexmark International, Inc

Lexmark Keyboards. Quality At Your Fingertips.

Circle 161 on reader service card.

IN THE WILD, THEY'RE KILLERS. IN BUSINESS, THEY'RE LIFESAVERS.

QMS 860 Hammerhead Print System 600x600 dpi • 11" x 17"/A3 • SRP $4595

QMS 860 Plus Print System 1200x600 dpi • 11" x 17"/A3 full edge-to-edge • SRP $5999

Dominant. Powerful. Precise. That's the formidable character of the QMS® 860 Hammerhead™ Print System. It's fast, compact and capable of remarkably accurate printing without hesitation.

And now the world's most popular 11 x 17/A3 laser printer is available with all of the features of the QMS 860, plus 1200x600 dpi resolution output...the powerful 24 MB QMS 860 Plus!

These desktop printers are creatures like no others - able to operate in mixed environments of PC, Macintosh® and workstation systems with standard and optional interfaces. Yet, with all their impressive power, they are both surprisingly affordable.

Others see them as killers. You'll see them as lifesavers. The QMS 860 and 860 Plus Print Systems. The perfect printing machines.

FEATURES	BENEFITS
• QMS 860 – 600x600 dpi output • QMS 860 Plus – 1200x600 dpi output	High resolution for camera-ready originals or accurate prepress proofs
• QMS 860 – Up to 11x17/A3 output • QMS 860 Plus – Up to 11x17/full bleed output (11x17 full edge-to-edge)	More flexible page layout, B-size check plots and no need for bling
• QMS Crown™ technology, featuring multitasking, advanced job spooling, compile-ahead processing, context switching and virtual memory	Increases print job responsiveness, provides a platform for convenient, cost-effective enhancements and enables peak performance as a network node with interfaces supporting protocols that include EtherTalk,™ NetWare® and TCP/IP
• Compatible with a variety of languages including PostScript™ Level 2 and Level 1, HP PCL® and HP-GL®	Accommodates the latest application software on all major platforms
• SIO (Simultaneous Interface Option)	Accepts data streams on all ports simultaneously to increase system responsiveness for all users
• ESP (Emulation Sensing Processor)	Eliminates user intervention to select compatible printer language
• 39 resident type fonts, all with multilingual character sets	Flexibility and creativity for document production
• An international network of service and support organizations in over 230 metropolitan areas throughout the U.S. and around the world	Fast, local response to service and support requirements
• Several convenient service plans that include on-site response within an average of 4 hours, emergency service and other options	Flexible programs designed to be just right for your needs
• Our exclusive Q-Fax (800-633-3850 or 205-633-3850) and CompuServe® (GO DTPVEN) services at your fingertips 24 hours a day	Quick and easy access to a full range of information and support
• Full one-year warranty	Parts and labor coverage for the important components of your print system
• Emergency telephone support	Direct dialog with technical experts
• On-site installation available	Experts to assure fast, trouble-free installation

HAMMERHEAD
THE PERFECT PRINTING MACHINE

To get your business "Lifesaver" now or for the dealer nearest you, call **800 841-0753** Dept. **4014.**

QMS

For service on QMS and other products, call 800 762-8894 (U.S.)
Q-Fax 800 633-7213 • E-mail: tnfo@qms.com • Canada 800 263-5508

PC MAGAZINE EDITORS' CHOICE
November 26, 1990
QMS 860 Print System

QMS, the QMS logo and Hammerhead are trademarks or registered trademarks of QMS, Inc. One Magnum Pass, Mobile, AL 36618, 205 633-4300
PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names are trademarks or registered trademarks of their respective companies

CHOOSE, BUY, AND INSTALL

Take Mom's Advice: Never Pay Retail

Your new server just arrived. Sleek. Fast. Fully loaded. A gorgeous machine. In fact, you're standing in your office admiring it when the boss comes in wearing that now-familiar smile. The smile that says, "I'm about to make your life miserable." Since becoming network manager, you've moved from obscurity to P.T. Barnum–class notoriety. "How's the installation going?" the boss inquires. "You mean this thing didn't come with everything?" you think. "Great," you reply with Tony-the-Tiger enthusiasm. "That's GREAT." Big grin. "Keep me posted. Oh, and keep up the good work." Keep it up? It's time to start it.

All you need to do is choose a network operating system (NOS), buy it, and install it. In three days. But things aren't that bad. Just follow our advice and you'll wind up with the NOS that suits your needs. Here's how we chose NetWare.

Whaddaya Want? NOSs fall into two general categories: server and peer-to-peer. NetWare is an example of the former, and Artisoft's LANtastic is an example of the latter. Which one you choose depends on how your office is organized.

Peer NOSs enable every system on the network to be either a server or a client. (Servers offer their disk drives, printers, and so on to clients.) Peer NOSs make it easy to pull a file off your co-worker's PC next door or to output to that PostScript printer down the hall. This flexibility makes it easy to create and tear down impromptu workgroups. In addition, because they don't require a dedicated machine, they offer an inexpensive way to connect systems. In fact, if you have only five or ten systems to network, a peer NOS is almost definitely what you want.

The chief drawback of peer NOSs is that they are very decentralized, making them hard to manage. Each user needs to have a decent understanding of what a network is and what the different systems on your network can do. Plus, if you need to use the printer that's connected to Bob's machine, and Bob has turned off his system and locked his office, you're out of luck.

My cohorts and I have looked at several peer NOSs: Artisoft's LANtastic, Microsoft's Windows for Workgroups, Performance Technology's PowerLan, and Novell's Personal NetWare. All had features to recommend them, but we wound up keeping Windows for Workgroups on our LAN. It has some drawbacks—we got a bit confused trying to install more than two network protocols on it—but its wonderful high-performance file system makes up for its shortcomings.

Server NOSs (also called client-server NOSs) dedicate specific systems to offer up their resources. Once you've made a system into a server, it can't act as a client—it lives only to serve. The great advantage of this system is that it's easy to manage: You know that you don't turn your server off, so all of its resources are available. You also know that you back up all the data on the server regularly, so it's all protected. And your users don't have to know about your network—most of the intricacies will be handled by the LAN administrator.

Of course, nothing is perfect. You must dedicate systems to act as servers, and you'll need at least one person who is an expert with the NOS you choose to act as the network administrator.

We installed and worked with several server NOSs: Banyan's Vines, Microsoft's Windows NT Advanced Server, and Novell's NetWare 3.12 and 4.01. All suited our needs, but after examining our existing NetWare server, we realized that we had one custom application that wouldn't run under any other NOS, so it was easy to make a quick decision: NetWare it had to be.

The choice between NetWare 3.12 and NetWare 4.01 was simple for me: With only one server, there was no reason for the more powerful (and more complicated) NetWare 4.01. If we had five or six servers, we would have more seriously considered the more expensive, more powerful sibling.

Shop Till You Drop Armed with a list of direct-mail vendors that sell NetWare, we went to the phones and made some inquiries. This was an eye-opener. For example: List price for a 50-user NetWare 3.12 box is $4,995 whether you buy it on CD-ROM or 3.5-inch floppy disks. After some phone calls, we got prices as low as $2,449. That's $2,546 below list.

In addition, some NetWare resellers were pricing the CD-ROM version differently from the 3.5-inch floppy disk version.

BEST BUY BETTER **SHOP AROUND**

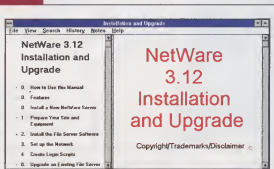
License Type	Highest Advertised Price	Highest Actual Price	Lowest Advertised Price	Lowest Actual Price
50 Users	$3,870	$2,799	$2,465	$2,449
100 Users	$5,550	$3,899	$3,479	$3,539

Watch Your Wallet: NetWare 3.12 prices vary dramatically. If you buy from your corner store, you could wind up paying too much. We called four major NetWare resellers for pricing information, and none of the prices they gave us matched the prices they were advertising.

WORKAROUND

NETWARE SPORTS A **NEW LOOK**

Better Help: When you get NetWare 3.12 on CD, you don't get 23 pounds of manuals—you get ElectroText. Even before you get your server up and running, you can put your CD into any Windows workstation and run ET.EXE.



There seemed to be no pattern to whether it was more or less expensive, but it was almost always a different price.

We ordered the NetWare CD-ROM from the lowball vendor and it arrived two days later. It was a small box. Much smaller than we expected. In fact, we expected it to be followed by several other, larger boxes. But it contained only the CD, one 3.5-inch floppy disk, and a couple of manuals. Thin manuals. Everything but the server installation came online.

Installation I won't spend a lot of time walking through the NetWare server installation—that's what the manual is for. That well-crafted, brilliant piece of expository writing, the *Novell NetWare 3.12 Installation and Upgrade Manual*. Bulwer-Lytton couldn't hold a candle to these pages. Despite its occasionally confusing syntax, however, the manual gives you more than enough information to install NetWare or migrate from one version to another.

Except when it's dead wrong, that is. Look on page 20, where step five proudly says, "Change to the drive letter corresponding to the CD-ROM and type INSTALL <Enter>." OK, got a firm picture of that? Now picture this: "Bad command or file name." INSTALL.EXE lives in the NETWARE.312\ENGLISH directory, not on the root directory of the CD-ROM.

Now you're on a roll. Except that you don't have any of the device drivers for your server's peripherals, do you? No disk drive driver, no SCSI adapter driver, no CD-ROM driver, no Ethernet card driver. Nada, nothing, zip. CompuServe time.

Fortunately, most server vendors put their drivers in their CompuServe forums. We were ever-grateful to Compaq for anticipating our needs and putting all the drivers for our awesome, brand-new Compaq ProLiant into one easy-to-find ZIP file. The rest of the installation was very straightforward.

The Changes NetWare 3.12 changes the default frame type from NetWare 3.11's Ethernet 802.3 standard to 802.2. Basically, these two frame types are like dialects of the same language—they're similar ways of pushing data onto and off of a network, but they use a slightly different grammar.

Edit your AUTOEXEC.NCF file and add a line to load your network driver with the 802.3 frame type. For the ProLiant with its NetFlex cards, we added the lines:

```
load CPQETHER slot=2 frame=
ETHERNET_802.3
bind IPX to CPQETHER [slot=2 frame=
ETHERNET_802.3 ] net=3
```

These two lines reload the Compaq Ethernet driver (in NetWare lingo, we use the module re-entrantly), and bind the IPX protocol to it so it can "speak" NetWare. Next time: Clients. JOHN MONTGOMERY

PC Contact | CLEAN HOUSE

MPURGE

This NetWare Loadable Module locates network files you don't need any more, then backs them up or even removes them automatically. You give it the search criteria—filenames and ages, for example—and it hunts down the files. Download MPURGE.ZIP from PC Contact's data library 3 (Utilities/Misc.) or see page 250 to order a disk from Public Brand Software.

NET TIPS

NOVELL NETWARE 3.1X

Problem: *You want to boost the performance of your NetWare-based database server.*

Solution: One of the simplest ways to get a performance boost is to purchase faster hardware. Database servers capitalize on faster CPUs and more memory. Short of purchasing new hardware, however, here are some software tips to boost database engine performance. First, if your database can use either the NetWare file system or the Direct File System, choose the latter. Second, load the MONITOR NLM and watch the LSL Receive Buffers. By default, NetWare allocates 10 LSL Receive Buffers, allowing up to 10 packets to be processed at once. After 10 packets, NetWare starts to discard them, and performance degrades. If you see that your LSL Receive Buffers are usually in full use, increase the default amount by adding the line

```
SET Minimum Packet Receive
Buffers=20 to STARTUP.NCF
```

and restart the server. If you're still using all of your LSL Receive Buffers, increase this number further. Third, use Packet Burst mode (load PBURST.NLM on the server and make sure your clients have the latest software). And finally, if you're already running TCP/IP on your clients, you may get better performance by loading TCP/IP on your server and using it as your default protocol.

ROBERT DOBBS
CHICAGO, ILLINOIS

Problem: *You're trying to upgrade your office's client software to the current VLMs, but you don't know which workstations have them installed and which don't.*

Solution: Because VLMs report their shell type as V4.00, you can use the SHELL_TYPE variable in the system

login script to notify clients to contact you for an upgrade. From the SYSCON utility, select Supervisor Options, System Login, and add the lines:

```
IF SHELL_TYPE < '4.00' THEN
BEGIN
  FIRE PHASERS
  WRITE "Contact your network
  administrator so you can"
  WRITE 'get the upgrade to the
  latest client software."
  PAUSE
END
```

RODNEY LISTER
CAMBRIDGE, MASSACHUSETTS

Problem: *You just installed several new NLMs and as a result your server performance is dropping.*

Solution: Chances are you've either run out of memory or one of these NLMs is not releasing the CPU. First, determine how well your NLMs are multitasking by checking to see if they are relinquishing control of the CPU. Load INSTALL.NLM from the server console and edit the AUTOEXEC.NCF file. At the end, add the line:

```
SET Display Relinquish Control
Alerts = ON
```

This tells the server to send a message to the console whenever an NLM holds the CPU for more than 0.4 seconds. You may be surprised at how many NLMs aren't good multitasking neighbors. Although you may still need to load an offending NLM, you'll know it degrades performance and will load it only when absolutely necessary.

If you're seeing poor multitasking, some NLMs may have exhausted your server's memory. Load MONITOR NLM and look at the Resource Utilization screen. If you see your memory running low, you should either unload some NLMs or reboot the server.

DAN DOHAN
SAN JOSE, CALIFORNIA

Problem: *Your Windows client gets the message, "The NETWARE.DLL file cannot be located."*

Solution: This probably means you have incompatible versions of IPX.COM and NETX.COM running on your workstation. Exit Windows, change to the directory that holds IPX and NETX, and type IPX/I, then NETX/I. The first command should yield at least Version 3.1, and the second at least Version 3.26. If your NETX is Version 3.22, you need to upgrade to do away with this error message.

RANDY KENNEDY
BOSTON, MASSACHUSETTS

Problem: *You just upgraded to Windows for Workgroups 3.11 and now you get the error message, "No Response From File Server."*

Solution: If you're running it on a Token Ring network, the problem is probably that Windows for Workgroups loads ROUTE.COM in your AUTOEXEC.BAT. Chances are that your server doesn't support source routing. Remove this line and you'll be up and running.

RANDY KENNEDY
BOSTON, MASSACHUSETTS

ARTISOFT LANTASTIC 6.0

Problem: *Windows locks as it loads on a LANtastic server.*

Solution: What's probably happening is that one of the server's drives is also mapped to a network drive. Like so many other things, this causes Windows to lock. If you really want all of the machines to access a particular drive on the same letter, you have to use the DOS SUBST command on the server. For example, edit the server's AUTOEXEC.BAT file and add the line:

```
SUBST Z: D:\DATA
```

Make sure this line comes after you load your network software.

NICOLAS WALDVOGEL
BRUSSELS, BELGIUM

Problem: *Using the Universal Client software, you can't connect to a NetWare server.*

Solution: Most often, this means that the NetWare server is using a different frame type from your client's. Change to the directory where you installed LANtastic 6.0 and edit the NET.CFG file using a text editor such as DOS 6.2's EDIT. Find the PROTOCOL IPXODI section and look for the frame type (for example, ETHERNET_802.3). By default, NetWare 3.11 servers use ETHERNET_802.3 and NetWare 3.12 and 4.x servers use ETHERNET_802.2. Change this line to match your server's frame type.

ARTISOFT CORP.
TECHNICAL SUPPORT

Problem: *You want a way to automate drive mapping each time you start your client.*

Solution: Use the NET SHOW/BATCH command. First, set up your client with all the drive mappings you want. Then, type NET SHOW/BATCH > MAP.BAT. This places the necessary MAP commands in a file called MAP.BAT. Edit STARTNET.BAT (also in the LANtastic directory) and at the end, add the line CALL MAP.BAT. If all of your clients use the same drive mappings, you can copy this file to all of them and call it in all their STARTNET files.

ARTISOFT CORP.
TECHNICAL SUPPORT

HOT TIP LAN MANAGER

Problem: You want your Microsoft LAN Manager clients to see Windows for Workgroups servers.

Solution: Microsoft LAN Manager and Windows for Workgroups are compatible but different in one important way: LAN Manager servers periodically send a broadcast message around the network announcing their presence—Windows for Workgroups servers don't. For LAN Manager clients to see Windows for Workgroups servers, you need to edit the Windows for Workgroups server's SYSTEM.INI file, go to the [network] section, and add the line LMAnnounce=Yes. Restart Windows for Workgroups and your LAN Manager clients should be able to see the server.

DAN DOHAN
SAN JOSE, CALIFORNIA

MGA: *Proven*
64-Bit Performance for $449

Don't believe the competition's FALSE performance comparisons. In PC Magazine's recent graphics review of 64-bit accelerators (June 28, 1994), MGA won ALL five Editors' Choice awards. But MGA delivers more than just speed. MGA offers the best performance at multiple resolutions and color depths, as well as the most advanced and comprehensive set of productivity features for Windows and CAD. Choose MGA - the industry approved 64-bit graphics accelerator!

PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE
MGA Impression ISA	MGA Impression VL-Bus	MGA Ultima Plus VL-Bus	MGA Ultima Plus PCI	MGA Ultima Plus 200 PCI

The New Standard in Graphics

"Overall, Matrox's MGA Impression and MGA Ultimo Plus series form an impressive array ond ore cleorly the best high performonce graphics accelerotors on the morket today."
James Karney, PC Magazine - June 28, 1994

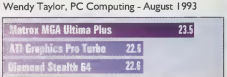
"A new graphics stondord from Matrox."
Stan Diehl, Byte Magazine - August 1993

64-Bit Performance

"MGA Ultimo delivers performonce that until recently wos found only in graphics workstotions."
Jon Pepper, Windows Sources - May 1994

Speed

"Matrox's 64-bit MGA boords ore the fostest video occelerators ever to come through our lobs. They're Windows speed demons."
Wendy Taylor, PC Computing - August 1993



Taken from PC Magazine's graphics review (June 28, 1994). WinBench 4.0 @ 1024 x 768 x 24-bit.

Ultra-High Resolutions

"While its speed alone is reason enough to buy the MGA Ultimo occelerator, the boord offers excellent color depth support at multiple resolutions."
Jon Pepper, Windows Sources - May 1994

True Color Acceleration

"At 24-bit color ... , the Motrox cord was neorly five times foster thon its neorest competitor."
Computer Shopper - May 1994

Reliable Software Drivers

"The Impression boord features the most stable 24-bit Microsoft Windows drivers ond the cleonest AutoCAD drivers we sow."
Winn L.Rosch, Jonathan Hill, James Karney, Jan Ozer, Lance Ulanoff, Jeff Mace
PC Magazine - June 28, 1994

"Matrox hos one of the best ... AutoCAD drivers on the morket today, DynoView..."
Art Liddle, CADalyst - June 1994

Flexibility

"If you're looking for o boord that runs your software ond supports your monitor no matter what you have, the Matrox MGA Ultimo fills the bill."
Winn L. Rosch, PC Computing - January 1994

INDUSTRY APPROVED
MATROX MGA POWER GRAPHICS

MGA Ultima and Ultima Plus Series

- 1600 x 1200 in 256 and 65K colors
- 1152 x 882 in 16.7M colors
- 120Hz refresh at 1024 x 768
- 2 MB VRAM **upgradable** to 4 MB
- PCI and VLB
- ISA and MCA (Ultima only)

Windows Productivity Features

- *Instant Modeswitch*™ for on-the-fly resolution and color depth switching
- *Pixel Touch* hardware pan and zoom
- *QCDP*™ true color dithering in 8 and 16-bit
- *Virtual Desktop* sizes up to 1600 x 1200
- ***New!*** *Monitor selection and testing* within Windows
- ***New!*** *Center Pop-Up* and *Center Window*
- ***New!*** *MaxVIEW* maximizes on-screen windows
- ***New!*** *PanLock* locks virtual desktop
- ***New!*** *Quick Access* repositionable iconic menu for MGA's hot-key features

DynaView™ CAD Features

- Real-time, double buffered *Spy Gloss* and *Bird's Eye* views
- Windows-like *Scroll* and *Zoom* Bars
- Resizeable and postionable *Main Window*
- Programmable pop-up *Iconic Menus* and *Tool Bars*
- *DynoView for Windows* - accelerated display list drivers for AutoCAD and MicroStation

Starting at ~~$599~~
$449 2MB PCI
1-800-361-1408

MATFAX: (514) 685-0174

Matrox Graphics, Inc.
Tel. 514.685.2630 Fax. 514.685.2853

WinBench 4.0 scores based on a 66 MHz PC based on using a Pentium/PS 90, 16 MB RAM, 256KB cache and Matrox MGA Ultima Plus 2MB PCI. Matrox, Matrox QCDP, Matrox Instant Modeswitch are registered trademarks of Matrox Electronic Systems Ltd.

matrox

Circle 155 on reader service card.

BACH, MICROSOFT, AND VIDEOHOUND

The Well-Tempered CD Clavier Variations

I found myself stumbling down yet another unmarked side street, the ubiquitous Nepali dust swirling at my feet. Hotel Yak & Yeti loomed ahead, an old Rani palace pressed into the tourism trade decades ago—not unlike so many Sherpas. A labyrinth of signs and jury-rigged corridors led to Boris' Chimney Restaurant. I bellied up to the bar and ordered mango lassi. An ancient Wurlitzer jukebox glowed in the corner, all burled wood and neon and bubbles flowing through colored conduits of water. Fished around in my pocket for a coupla rupees.

Lassi in hand—and ready as always for a few scratchy vinyl oldies—I strolled over to the juke, and . . . the damn thing was full of CDs! A little nine-pin dot-matrix label sat next to the juke's maw: "U.S. Dollars Only," it said. Ain't progress wunnerful?

This month we're going to build a CD jukebox. The original idea for this macro came from a question posted on PC Contact, the *PC Computing* forum on ZiffNet (see page 250 for log-on instructions). A reader had just installed Word 6.0 for Windows and wondered if there was an easy way to dive straight into various reference books, on various CDs, from inside Word. The answer? Absolutely!

You know the feeling. You're typing along, and all of a sudden you have to look something up. Most word processors these days have adequate (even good) spell-checking dictionaries and thesauri. But if you need an encyclopedia or an atlas—or anything else that isn't built into the program itself, for that matter—switching over can be tedious at best. By the time you've Alt-Tabbed out to Program Manager, found the right icon, and brought that trusty multimedia encyclopedia to life, there's a 50-50 chance you've forgotten what you wanted to look up in the first place.

We're going to write the macro in WordBasic because it's the macro language we know best. It should translate easily to Ami Pro or WordPerfect, or any other Windows application with a Basic-like language that supports the Shell command.

Start Up Before you can write the macro, there's a bit of necessary legwork. Gather together all of the CDs you're likely to stick in your virtual "jukebox," make sure they're installed properly, and locate

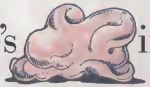
HOW TO DO IT HOT-DOGGING APPLICATIONS WITH WORDBASIC

This Word for Windows macro lets you choose from a list of programs—presumably programs on CDs—then launch those programs from inside Word for Windows. It works with either Version 2.0 or Version 6.0.

```
Sub MAIN
REM CD Jukebox - PC Computing, September 1994
REM Arrays hold descriptions of each CD in the jukebox,
REM plus the command lines necessary to run them
REM
Dim Description$(5), CommandLine$(5), WorkingDir$(5)
Description$(0) = "MS Bookshelf '92"
CommandLine$(0) = "c:\viewer\viewer.exe ↵
↵ e:\books\books92.mvb"
Description$(1) = "Bartlett's Familiar Quotations"
CommandLine$(1) = "c:\viewer\viewer.exe ↵
↵ e:\books\bquote92.mvb"
Description$(2) = "American Heritage Dictionary"
CommandLine$(2) = "c:\viewer\viewer.exe ↵
↵ e:\books\dict92.mvb"
Description$(3) = "Columbia Interactive Encyclopedia"
CommandLine$(3) = "c:\cie\cie.exe"
Description$(4) = "Columbia Quotes"
CommandLine$(4) = "c:\quotes\aapex.exe ccdq.dbp"
WorkingDir$(4) = "c:\quotes"
Description$(5) = "VideoHound"
CommandLine$(5) = "c:\vh\vh.exe"
REM
REM Set up the custom dialog
REM
Title$ = "The Well-Tempered CD"
Begin Dialog UserDialog 320, 144, Title$
    OKButton 226, 2, 88, 21
    CancelButton 226, 26, 88, 21
    Text 10, 36, 134, 13, "Program to Launch:"
    ListBox 10, 55, 302, 84, Description$(), .ProgNumber
End Dialog
Dim GetProgram As UserDialog
REM
REM Run the custom dialog
REM
On Error Goto UserClickedCancel
Dialog GetProgram
On Error Goto 0
i = GetProgram.ProgNumber
REM
REM Have the user load the correct CD, change the directory if
REM necessary, then "shell to" (i.e., run) the chosen program
REM
If MsgBox("Insert CD for " + Description$(i), Title$, 1) Then
        If WorkingDir$(i) <> "" Then ChDir WorkingDir$(i)
        Shell CommandLine$(i)
End If
UserClickedCancel:
End Sub
```

There's on the keyboard,

there's a in the printer,

there's  in the A: drive,

there's an on the front,

there's only one way to fix it good as new.

Whether it's a mouse or a mainframe, the parts you fix it with should be the same kind we made it with—high-quality, rigidly tested, warrantied IBM parts.

We have a full range of parts for all IBM products, including older systems like PC/XTs™ and System/36s, and you can get exchange prices on selected items.

What's more, IBM parts are always available, and so are we. You can call us toll free 24 hours a day, 7 days a week for orders or price quotes, and, yes, we'll be happy to accept your Visa, MasterCard or American Express.

IBM®

IBM PARTS

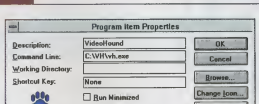
For orders or price quotes call anytime:

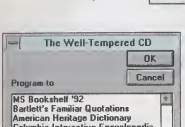
1 800 388-7080

©1994. IBM is a registered trademark and PC/XT is a trademark of IBM Corporation.

WORKAROUNDS TRANSPORT COMMAND LINES

Locate Command: To find a program's Command Line, go into Program Manager, click once on the program's icon, then on File, Properties.





Transfer to Macro: Now tuck that information into the WordBasic macro in "Hot-Dogging Applications with WordBasic," page 242. When you run this macro in Word for Windows, you'll get something like the screen at left. Double-click on a description and the CD Jukebox will prompt you to insert a CD, then launch the program.

their icons in Program Manager. Then, carefully write down which command line calls up each program. From Program Manager that's easy: Click once on the program's icon, click on File, then Properties, and jot down the line that appears in the Command Line box (see "Transport Command Lines," above). If there's a default directory associated with the program—it'll be in the Working Directory box, just below the Command Line—make sure you write that down, too.

Oft Used We've collected six programs we often use while writing. The first three come from the Microsoft Bookshelf CD. Then there's the Columbia Interactive Encyclopedia and AAPEX's Columbia Quotes. Finally, no library could be complete without Visible Software's reference to the (sniff) art and science of motion pictures, VideoHound. Yeah, yeah, yeah. That's the price you pay for good research, eh?

Armed with this inventory, you're ready to write the macro. Fire up Word, click on Tools, then Macro. Type in a name like `CDJukebox`, and hit Enter. Word provides the `Sub MAIN` and `End Sub`; you get to type in everything else. Working from the code listed in "Hot-Dogging Applications with WordBasic," page 242, substitute your own CD descriptions, command lines, and default directories, if any. The code will handle up to six CDs numbered from 0 to 5 in your jukebox. If you need more CDs, increase the subscripts in the `Dim` statement.

There are a couple of tricky parts to the macro. Writing custom dialog boxes in WordBasic is a rather . . . obtuse undertaking. There are many odd commands. Twiddle with the sample code between `Begin Dialog` and `On Error Goto 0`, and you'll get the hang of it.

The `1` in the `MsgBox()` command simply tells Word to put OK and Cancel buttons in the message. If the user clicks on OK, `MsgBox()` evaluates to `True`, the macro switches directories (with the `ChDir` command) if one is specified, then launches the chosen program by "Shelling out to" whatever is on the command line.

When you have it just about right, click on File, then Save, and then take the Jukebox on a test drive by clicking on the right-wedgie (Play) button.

Now put the CD Jukebox on your Toolbar. Click on Tools, then Customize, and make sure the Toolbars filecard is showing and that "Save Changes In" reads `Normal.dot`. On the left, scroll down to Macros. Then, on the right, click and drag CDJukebox onto the Toolbar. Pick a picture for it, click on Assign, and you're done.

Oh. We fooled you. The CD Jukebox doesn't *really* require that the programs reside on CD! It'll work with any program.

WOODY LEONHARD & VINCENT CHEN

Got a cool idea for a macro? Just drop a note to WOODY *at 72241,2125 or* VINCE *at 72241,2221 on PC Contact.*

TOOL TIPS

ASSEMBLER

Problem: *You want to clear the keyboard buffer.*

Solution: If you're using a DOS input function to read the keyboard, just invoke it through DOS function `0Ch`, which clears the buffer beforehand. Here's one way to do it if you're not using DOS input functions.

Set the buffer's head and tail pointers (maintained in the BIOS data area) equal to each other. The BIOS data area is a region of low memory (segment 40h) that the BIOS uses to store information that it can't store in ROM. The head and tail pointers hold the keyboard buffer locations that the next key code will be read from and written to. The head pointer is stored at `40:1A`, the tail pointer at `40:1C`. Set them equal to empty the keyboard buffer. Here's a simple assembly language routine that shows how:

```
mov     ax,40h
mov     ds,ax
mov     ax,[1Ah]
mov     [1Ch],ax
```

JEFF PROSISE
CONTRIBUTING EDITOR

WINDOWS PROGRAMMING

Problem: *You want a good way to prevent multiple instances of your application from starting.*

Solution: You could just prevent a second instance of the application from being started. This confuses inexperienced Windows users, because the program refuses to start and the previous instance may be obscured. A more user-friendly way to prevent multiple instances of a program from running is to display a message box, like this:

```
if (hPrevInstance) {
MessageBox (hwnd, "There is ↵
↳already an instance of this "↵
↳"application running. Click its ↵
↳title bar to activate"↵
↳"it.", "Stop!", MB_OK |↵
↳MB_ICONINFORMATION);
return 0;
}
```

Hot Performance.

Cool Prices.

The AT&T

Globalyst™

Family

of

PCs.

AT&T
Global Information
Solutions

The Only Winner of
PC/Computing's 5-Star Award

PC/Computing
Direct Top of... July 1994

Bring Computing & Communications Together With An Award-Winning Vendor.

The Globalyst™ Family of PCs is a new generation of personal computers from AT&T Direct, ***PC/Computing*** magazine's top-rated direct vendor. AT&T Globalyst PCs make it easy for you to take the next step forward in PC productivity: combining computing and communications.

A Computer For Your Expanding World.

GET IT move USE

The way you use your computer is expanding rapidly. That's why we designed AT&T Globalyst PCs with super fast bus systems to handle high speed graphics software; multimedia packages that add whole new dimensions to your PC's capabilities; and the ability to easily add fax/modems for home-to-office communications. All AT&T Globalyst systems are **pre-loaded with MS-DOS™ and Microsoft Windows™** and come with a keyboard and Microsoft mouse. Plus, all Globalyst PCs are upgradable to PCMCIA. And when you're ready, add voice and visual capabilities that will open up to you yet another world of computing and communications.

Today's PC For Tomorrow's Communications.

Globalyst 486 PCs are easy to upgrade. Zero Insertion Force (ZIF) sockets make it a snap to install Intel's Pentium™ OverDrive™ processor. They come with **"plug and play" expansion slots** that let your PC grow with you. And our FlashBIOS makes upgrading easy too!

Powerful, Not Wasteful.

All Globalyst PCs have power management to keep the PC in sleep mode when you're not using it. This will save energy and electricity costs. And all major plastic parts in the Globalyst PCs are recyclable.

What Award Winning Service Means.

Most AT&T PCs are covered with a **FREE three-year warranty**, including parts and labor.* And when you have a question, call our 24-Hour Techline for help. Your system is also supported by a road-ready crew of over **3,800 AT&T Service Technicians** in over **700 locations nationwide** offering next business day service.

Toll-Free 24 HOUR Phone Support

AT&T Makes Financing Easy.

Use your AT&T Direct Card for purchases over $2,000 and **save finance charges** if fully paid within 6 months. Ask about our other easy payment options.†

Buy The Way You Like.

From AT&T Direct or from a knowledgeable AT&T reseller or retailer. **With AT&T, it's always easy.**

Globalyst™ 515

Ready For Your Desktop

A powerful, entry-level PC. Ready to plug and play. And an energy-saver, too!

$1,385 or $50/mo.

- Intel Pentium™ OverDrive™ Ready
- Intel486™ SX/33
- 170MB Hard Drive
- 4MB RAM
- VESA Local Bus
- 14" SVGA .28mm NI Monitor
- Energy Star Compliant
- Intelligent Power Management

Buy With Confidence From AT&T Direct.

PC/Computing's ***ONLY*** overall 5-star winner. Let us be your source for outstanding sales, service and support. Where a great PC is more than great price.

PC/Computing
Direct Top 66, July 1994

Overall Service/Warranty Rating

Company	Sales/ Service Rating	Customer/ Warranty Rating	Overall Rating
AT&T Direct	4.5	4.5	4.0
IBM Direct	3.5	4.0	4.0
Compaq Direct Plus	4.0	3.0	[illegible]
Gateway 2000	2.5	3.5	[illegible]
Dell Computer Corp.	4.0	3.0	[illegible]

[illegible] PC/Computing [illegible]

Make Your Move To Multimedia With AT&T.

Globalyst™ 515
$2,135 or $76/mo.

- Intel Pentium™ OverDrive™ Ready
- Intel486™ SX2/50
- 170MB Hard Drive
- 8MB RAM
- VESA Local Bus
- 14" SVGA .28mm NI Monitor
- Energy Star Compliant
- Intelligent Power Management
- Pre-loaded Microsoft Works: *A complete word processing/database/spreadsheet all in one package!*

intel inside

Includes a complete multimedia package:

- Sony Dual Speed CD-ROM Drive
- Labtec Stereo Speakers
- Softbank™ Software: *A FREE CD-ROM catalog with more than 170 top Windows software products to try before you buy.*
- 16-bit MediaVision Sound Card
- Compton's Interactive Encyclopedia™
- AT&T Multimedia Showcase: *Games, Icons, Clip Art and Sound Effects.*

MULTIMEDIA UPGRADE KIT!
Add our complete multimedia package to select Globalyst PCs for only **$315 installed.**

EXCITING NEW MULTIMEDIA BUNDLES! ONLY $45 PER BUNDLE!
Your choice with the purchase of any AT&T PC.

Business Productivity Bundle:
Astound-Multimedia Business Studio, Sound Effects Library, InPrint Art Library 101 Scenic Photos.

Business Reference Bundle:
Allegro PC Library, Phone Disc USA Business, Allegro Business Reference Library.

Family Discovery Bundle:
Sony Dinosaurs, VideoHound, Better Homes and Gardens Cookbook.

Family Entertainment Bundle:
Return to Zork, Teddy's Big Day, Dr. T's Sing-Along.

Hours: M-F 8-8; Sat. 10-6 (EDT)
Now serving Canada! Call for prices.

Multimedia For Home Or Office

A terrific combination of applications and economy. This Globalyst PC has room to handle a complete multimedia package. Plus all the multimedia software you've been waiting to buy. And deliver them at thrilling speeds. (Not to mention a thrilling price, too!)

AT&T Makes It Easy To Get On The Internet.
$189 ON-LINE SPECIAL
Available on all AT&T Globalyst PCs.
This $250 value includes:

• AT&T DataPort™ 14.4 Data/Fax Modem
SIX ON-LINE PACKAGES:
AT&T EasyLink™, America On-Line, CompuServe, GEnie, Prodigy and Sierra Network
• WordPerfect® ExpressFax™

Make Your Globalyst™ PC Network Ready. Only $169!

AT&T will add an Ethernet card and the capability to connect to your local and/or remote Novell NetWare and Microsoft-based networks, send and receive faxes, e-mail, scheduling, and more... with superior performance! Ask about Token Ring, WaveLan and modem options to provide you with the widest range of communications capabilities!

AT&T Global Information Solutions

AT&T Direct The Computer Source **1-800-209-9352**

Power, Speed, Expandability–AT&T PCs Have It All.

Ideal Blend Of Power And Speed

A great PC for home or office. Plenty of memory for storing the latest applications. With plenty of speed for running them. And it's Energy Star compliant, so it won't throw your electric bill into high gear.

Globalyst™ 550

$2,355 or $85/mo.

- Intel Pentium™ OverDrive™ Ready
- Intel486™ DX2/66
- 270MB Hard Drive
- 8MB RAM
- 1MB DRAM
- PCI Local Bus
- 2 PCI/ISA and 3 ISA slots
- 14" SVGA .28mm NI Monitor
- Energy Star Compliant
- Intelligent Power Management

intel inside

Great Expansion Capabilities!

A superb machine. Our fastest PC ever. For those who like to "wind it out" on the Information Highway. Designed as a high performance Windows client, desktop publishing client, CAD workstation or as a basic, high-performance desktop server.

Globalyst™ 590

$3,159 or $113/mo.

- Intel Pentium™ 66 MHz Processor
- 256 KB Write-Back Cache
- 270MB Hard Drive
- 8MB RAM
- 1MB dual ported VRAM
- PCI Local Bus Video and hard drive controller
- 2 PCI/ISA and 3 ISA slots
- 14" SVGA .28mm NI Monitor
- Power Management

Get Going With Our Ergonomic Notebooks!

Affordable, Portable Power!

It's light, fast and packed with pre-loaded software. The Globalyst 200 has an ergonomic keyboard with integrated trackball for more comfortable use. And you can use PCMCIA Type II and Type III slots simultaneously.

Globalyst™ 200

Passive Color **$2,449** Active Color **$3,299**

- Intel486™ SX/33
- 170MB Removable Hard Drive
- 3.5" 1.44MB Internal Floppy Drive
- 4MB RAM (upgradable to 20MB)
- Large 9.5" 256 color screen
- Local Bus Video with 1MB RAM
- NiMH Battery (up to 4 hours)
- Pre-loaded Software: MS-DOS, Windows, System Utilities, Tour Guide, BitFax, AT&T Mail
- Optional Quick Dock & Power Dock Modules available
- **Optional AT&T Keep in Touch™ 14.4 Data/Fax PCMCIA Modem only $329!**

AT&T Global Information Solutions

AT&T Direct The Computer Source

CALL: 1-800-209-9352

For a reseller near you: 1-800-624-7187

AT&T and the AT&T globe design are registered service marks and trademarks of American Telephone and Telegraph Company. The Intel Inside logo is a trademark of the Intel Corporation. DOS and Windows are trademarks of the Microsoft Corporation. All other trademarks acknowledged. Prices, configurations and availability subject to change without notice.* 1 year warranty on monitor.† Monthly payments required; valid through 12/31/94. Prices and terms do guarantee do not include shipping. Shipping charges are calculated according to weight and distance. Appropriate sales tax will be added. AT&T Global Information Solutions is not responsible for errors in typography or photograph.
© September, 1994 AT&T Global Information Solutions.

An even more elegant way to handle this situation is simply to activate the other instance:

```
if (hPrevInstance) {
hwnd = GetWindow
(GetDesktopWindow (),
GW_CHILD);
while (GetWindowWord (hwnd,
GWW_HINSTANCE) !=
hPrevInstance)
hwnd = GetWindow (hwnd,
GW_HWNDNEXT);
SetFocus (hwnd);
return 0;
}
```

If hPrevInstance is non-NULL, this routine uses GetWindow and GetWindowWord to determine the window handle of the previous instance's main (top-level) window. Then it calls SetFocus to activate it. If the previous instance was obscured behind other windows, it will now jump to the foreground.

JEFF PROSISE
CONTRIBUTING EDITOR

EDITABLE GRIDS

Problem: *The grids made by the grid custom control (the VBX that looks like a spreadsheet) are not editable.*

Solution: You can't make them editable, but you can do a good fake. Set them up so that as you move through the grid, the grid triggers a RowColChange event. In this event, you can position a standard Visual Basic edit box in the current cell. Add this code to your grid:

```
Sub Grid1_RowColChange()
'dimension variables
Dim OffsetY%, OffsetX%, I%,
LineWidth%
'initialize the location for the text box
OffsetX = Grid1.Left +
Screen.TwipsPerPixelX 'border
OffsetY = Grid1.Top +
Screen.TwipsPerPixelY 'border
'convert the GridLineWidth from
pixels to twips
LineWidth = Screen.TwipsPerPixelX
* Grid1.GridLineWidth
'calculate the distance to right to
place the text box (including the
grid lines)
For I = Grid1.LeftCol To Grid1.Col - 1
    OffsetX = OffsetX +
    Grid1.ColWidth(I) + LineWidth
Next I
'calculate the distance from the top
to place the text box (including
the grid lines)
For I = Grid1.TopRow To Grid1.
Row - 1
    OffsetY = OffsetY + Grid1.
    RowHeight(I) + LineWidth
Next I
'move the text box and set the focus
to it
Text1.Move OffsetX, OffsetY,
Grid1.ColWidth(Grid1.Col),
Grid1.RowHeight(Grid1.Row)
Text1.ZOrder 0
Text1.SetFocus
End Sub
```

Unfortunately, this works only under simple circumstances. For example, the grid can't scroll, and this code does not account for fixed rows or columns. Also, you need to store the data entered into the text box in the cell of the grid, which needs to be done in the text box's Change event.

TECHNICAL SUPPORT
SHERIDAN SOFTWARE

BELLY UP TO TOOLBAR

Problem: *Visual Basic lacks a toolbar custom control.*

Solution: You could use group push buttons with pictures assigned to each, but if you have more than a few of these, you'll exhaust Windows' resources. Instead, set up a picture box and put an array of image controls on it. Configure the control array so that every other image control has the depressed image of the button. Assign the code below to that control array:

```
'This flag is defined in the General
Declaration area of the form.
Dim fMouseDown%
Sub Image1_MouseDown (Index As
Integer, Button As Integer, Shift
As Integer, X As Single, Y As Single)
 If Button And 1 Then
    'Move the "down" image control
    to where the "up" is
    Image1(Index + 1).Move
    Image1(Index).Left, Image1
    (Index).Top
    'Make the "up" Invisible and
    the down Visible
    Image1(Index).Visible = False
    Image1(Index + 1).Visible = True
    'Set our flag so we know the
    mouse is down in other events
    fMouseDown = True
 End If
End Sub
Sub Image1_MouseMove (Index As
Integer, Button As Integer, Shift
As Integer, X As Single, Y As Single)
 'If the mouse is no longer over the
button and the down image is
displayed display the up image
If fMouseDown Then
    'offset x and y since the button
    is in a container
    X = X + Image1(Index).Left
    Y = Y + Image1(Index).Top
    If X < Image1(Index).Left Or
    X > Image1(Index).Left +
    Image1(Index).Width Or Y <
    Image1(Index).Top Or Y >
    Image1(Index).Top +
    Image1(Index).Height Then
        'Make the Down Invisible
        and the Up Visible
        Image1(Index + 1).Visible =
        False
        Image1(Index).Visible = True
    Else
        'Make the Up Invisible and
        the Down Visible
        Image1(Index).Visible = False
        Image1(Index + 1) = True
    End If
 End If
End Sub
Sub Image1_MouseUp (Index As
Integer, Button As Integer, Shift
As Integer, X As Single, Y As
Single)
fMouseDown = False
'Make the Down Invisible and the
Up Visible
Image1(Index + 1).Visible = False
Image1(Index).Visible = True
End Sub
```

TECHNICAL SUPPORT
SHERIDAN SOFTWARE

HOT TIP VISUAL BASIC 3.0

Problem: Visual Basic doesn't let you hide multiple document interface (MDI) child forms, making a mess of your screen as they redraw.

Solution: Instead of trying to set its property to Invisible, move the form to an invisible location on the screen. The simplest way to do this is to set the MDI child form's Top property to the negative Height property (for example: frmChild.Top = -frmChild.Height) Then set its Left property to the negative Width value:

```
(frmChild.Left = -
frmChild.Width)
```

TECHNICAL SUPPORT
SHERIDAN SOFTWARE

This Month's Free Software and Shareware

All the public-domain and shareware programs and utilities featured in *PC Computing* each month are available on our online service, PC Contact, or on disk from Public Brand Software for a fee. Shareware requires additional payment to authors for continued use. This month's files are available in PC Contact's data library 3 (Utilities/Misc.). For information on ordering them from Public Brand Software, see below. Here's a sampling of the programs you'll find this month.

WINDOWS: WORD ADD-ON 220

WOPR If you use Word 6.0 for Windows, you need Woody's Office Power Pack (WOPR). It adds the file management that WordPerfect for Windows lords over Word, and a few other neat features, such as a better envelope creator. Download WOPR6L.ZIP.

DOS: XTREE REBORN 226

4FILES If you want a graphical front end to DOS, try 4FILES. This XTree-like program enables you to move files and even annotate them. If you don't like your compression software, use 4FILES as a front end. Download 4FILES.ZIP or call Larry T. Edwards at (907) 747-8996.

NETWORKING: CLEAN HOUSE 239

MPURGE Hierarchical storage management—moving unused files onto slower, less-expensive media than disk drives—is becoming popular in the NetWare realm. If you're interested, try MPURGE, a NetWare Loadable Module (NLM), to locate and back up files you don't need. Download MPURGE.ZIP for a demonstration copy.

TOP PICKS ON DISK

You can easily get all the public-domain utilities or shareware covered in this month's issue by calling Public Brand Software at (800) 426-3475 or (317) 856-7571. Ask for this month's Editors' Picks from *PC Computing*. They're available for $5 or less per disk (most disks have several utilities and programs on them), plus $5 for shipping and handling.

HOW TO JOIN

Current CompuServe or ZiffNet members type GO ZNT:PCCONTAC at any CIS I prompt. Cost varies depending on which CompuServe plan you belong to and the speed at which you connect. For complete membership and hourly rate information, type GO RATES while online.

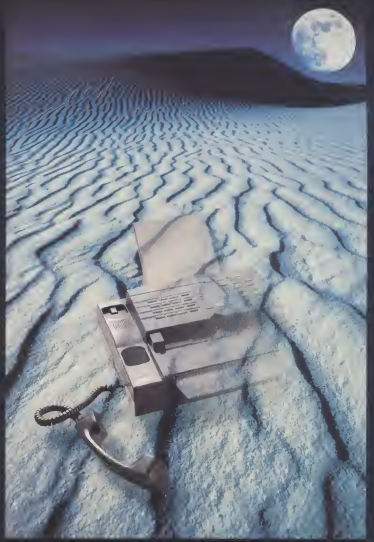
ZiffNet users pay a monthly membership fee of $2.95. This support fee provides a variety of free and chargeable services. For the latest information about these services, type GO ZNT:ZIFFHELP and download the files GOWORD.TXT and FREE.TXT from data library 1 (General Information).

Follow these steps to join ZiffNet and participate in the PC Contact forum:

1. Set these modem and software parameters: 7 data bits, even parity, 1 stop bit, full duplex.
2. Call CompuServe's sales department at (800) 848-8199 (United States and Canada). From other countries, dial CompuServe direct at (614) 457-8650. You can also call CompuServe with your modem. Set your modem as instructed above and dial (800) 346-3247. Press Enter when your modem connects. Type PHONES at the HOST NAME prompt, press Enter, and follow the onscreen prompts to find a local access number.
3. Dial the access number with a modem. When your modem connects to the network, press Ctrl-C to get the system's attention.
4. At the HOST NAME prompt, type CIS and press Enter.
5. At the USER ID prompt, type 177000,5300 and press Enter.
6. At the PASSWORD prompt, type PC/CONTACT and press Enter.
7. At the ENTER AGREEMENT NUMBER prompt, type PCC94 and press Enter.

INNOVATE OR DIE.

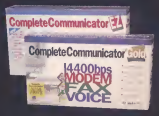
Are you using yesterday's technology to succeed in today's business world?
The Complete Communicator Gold and Complete Communicator EZ voice-fax-data modems will provide your business with the communication solution needed to survive in a competitive world. With extensive voice mail features like up to 1000 password protected mailboxes, private or public fax on demand, remote retrieval, pager notification, professionally recorded voice prompts as well as personalized greetings for individual mailboxes, you'll have the features of voice mail systems that cost thousands.



Want total performance? The power of the *Complete Communicator Gold*, with 14.4Kbps send and receive fax and throughput up to 57.6Kbps, makes faxing and transferring large documents and files quick and efficient. The *CCOM™ Gold* also supports business audio.

When speed is not your first priority, the *Complete Communicator EZ* is your business solution, providing many of the voice mail features of the *CCOM Gold* for half the cost.

Speed, ease of use, and the highest quality available in the world. Two great products from the company that innovated voice-fax-data modem technology. Your clients will think you just spent a small fortune. We'll know better.



Now the message has a medium.

TheComplete PC®
High Quality Communication Solutions

6413 Congress Avenue, Boca Raton, FL 33487
Tel: (407) 997-9683 Fax:(407) 997-9657
TheComplete PC, Inc., TheComplete PC, Complete Communicator Gold and the Complete Communicator EZ are trade marks of the Complete PC, Inc. Other product names or company names mentioned are trademarks of their respective companies.
Copyright © 1994

yes
Fast Ethernet
NetWare

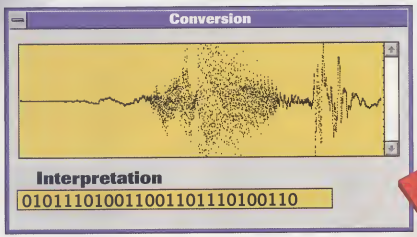
Circle 144 on reader service card.

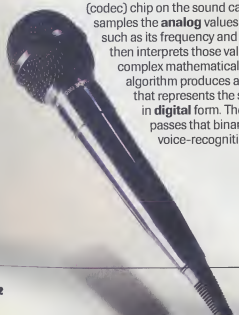
How It Works

BY RON WHITE
ILLUSTRATED BY
TIMOTHY EDWARD DOWNS

Voice Recognition

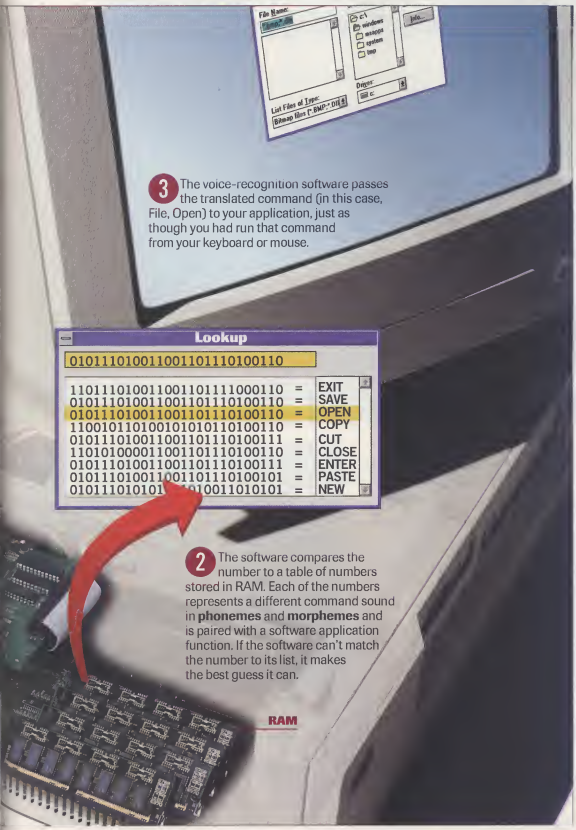
It's no longer science fiction—it's a new tool that can make your computer easier to use. Many utilities can now translate your spoken words into commands—some can even take dictation, but those are rarer. Let's take a look at how your computer gets from the word "open" to the command File, Open.





1 You speak into your sound card's microphone, either **continuously** or **discretely,** depending on the recognition engine's capabilities. The microphone passes the word or words through a coding/decoding (codec) chip on the sound card. The **codec** samples the **analog** values of the sound—such as its frequency and amplitude—and then interprets those values using a complex mathematical algorithm. The algorithm produces a binary number that represents the spoken command in **digital** form. The sound card then passes that binary number to the voice-recognition software.

Say the Word: Your Computer Is All Ears



3 The voice-recognition software passes the translated command (in this case, File, Open) to your application, just as though you had run that command from your keyboard or mouse.

2 The software compares the number to a table of numbers stored in RAM. Each of the numbers represents a different command sound in **phonemes** and **morphemes** and is paired with a software application function. If the software can't match the number to its list, it makes the best guess it can.

KEY WORDS

Continuous: In this context, it's the ability to recognize words without requiring the speaker to insert a pause between them.

Discrete: When a voice-recognition system requires a pause between each word or phrase before translating it into a digital code that is then used by software, the system is called discrete.

Codec: This is an acronym for coding/decoding, a process that converts analog signals to digital code, and vice versa.

Analog: When you measure continuous physical variables, such as a sound that is wavering in pitch and/or volume, a changing electrical current, or time, you're using analog values.

Digital: When you use numbers to represent values, such as analog measurements, you've gone digital.

Phoneme: A small set of sounds constitutes the "building blocks" of a language. Phonemes are considered to be the basic distinctive units of spoken sound from which morphemes, words, and sentences are constructed.

Morpheme: The minimal grammatical unit of a language, morphemes are usually larger than phonemes. Each morpheme constitutes a word or meaningful part of a word that cannot be divided into smaller, independent, grammatical parts, such as "the," or the "ed" of "wanted."

UNDERSTAND V.WHATEVER

Modem Standards: Which One Is Right for You?

Being connected is in. Whether you telecommute, exchange opinions on CompuServe, or send and receive e-mail and faxes, the telephone wire is your lifeline. And, of course, the key element that marries your PC to the telephone wire is the modem. But do you understand how your modem does its job? And, if you're in the market, what kind of modem should you choose?

In ancient times (before the breakup of AT&T, that is), choosing a modem was relatively simple. That's because AT&T held a near-monopoly on local and long-distance telephone service and specified, created, and owned any device that connected directly to its telephone network—including modems. Although you had little choice when buying and connecting a modem, it made life joyously simple.

Today, the world of communications is different. A staggering variety of modems is available from scores of different manufacturers. Unfortunately, as modem availability has increased, so has the complexity of the underlying technology. But with a little background and some practical tips, you'll be able to choose a modem that's right for your communication needs today and tomorrow.

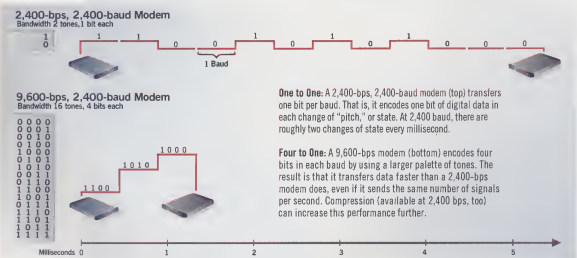
What a Modem Does A modem is a kind of digital-to-analog, analog-to-digital converter. Your PC is digital—that means that the signals it uses to manipulate information occur in only two distinct states: on and off. For your PC to communicate with external devices, therefore, those devices must also be digital.

Your telephone, on the other hand, is principally analog—that means a telephone signal can assume any value within a range designed to accommodate the human voice. Normally, that range is about 3,000Hz wide. (Trivia note: The telephone you use today employs principles and circuitry that have changed little since Alexander Graham Bell's time.) The task of melding the digital world of your PC to the analog world of the telephone falls to your modem.

In practice, a modem receives a digital signal from a PC and converts, or modulates, it to an analog signal. It preserves the information content of the digital signal as a sequence of analog audio tones. It then

HOW IT WORKS THE DIFFERENCE BETWEEN BITS AND BAUD

A modem translates your PC's digital language into analog tones to send over a phone line. The number of tones it sends every second is measured in baud, and since there can be more than one bit of data per baud, the total data transfer rate is measured in bits per second.



One to One: A 2,400-bps, 2,400-baud modem (top) transfers one bit per baud. That is, it encodes one bit of digital data in each change of "pitch," or state. At 2,400 baud, there are roughly two changes of state every millisecond.

Four to One: A 9,600-bps modem (bottom) encodes four bits in each baud by using a larger palette of tones. The result is that it transfers data faster than a 2,400-bps modem does, even if it sends the same number of signals per second. Compression (available at 2,400 bps, too) can increase this performance further.

Anderson & Lembke, Inc.

FIRST WE CHALLENGED THE COMPETITION. THEN WE CHALLENGED OURSELVES.

Presenting the new Agfa Arcus II.

With all the praise the Arcus family has won, you'd think we'd rest on our laurels. Think again. The Agfa Arcus II is a completely new, 600 x 1200 ppi, 36-bit color scanner with an integrated transparency module. It's also designed to be the best machine you can put on your desktop.

Compared to other "desktop" scanners, the new Arcus II can capture more highlights and shadows, thanks to its 3.0 dynamic range. That's the kind of image quality you used to have to send out for. Plus, no other top-of-the-line "desktop" scanner comes with Agfa FotoLook scanning software, Agfa FotoTune color management software, and full Adobe Photoshop™ software built in.

And no one else can offer you our new, 42-page *Introduction to Digital Scanning*, which takes you step by step through a variety of scanning situations.

Truth is, with everything we added to the Arcus II, we're expecting some more awards. But the real prize winner will still be you. Call 1-800-685-4271 to find out more information on Agfa's new scanners.

AGFA Agfa

The complete picture.

AGFA and the Agfa rhombus are registered trademarks. Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in some jurisdictions.

Circle 126 on reader service card.

transmits these tones over telephone lines in much the same way that your voice travels over them. At the other end, another modem receives the analog signal and reconverts it—or *demodulates* it—back to digital form. (Another trivia note: It is from this process of modulating and demodulating a signal that we derive the acronym *mo-dem*.)

Baud and Bit Rate Modem speeds are measured in *bits per second* (bps), not to be confused with *baud*. The difference between the two is subtle but important. Baud is the number of changes in state that occur in the transmitted signal each second. What's a change in state? Basically, it's when the modem changes from doing one thing to doing another—for example, a change from sending a 1,200Hz tone to sending a 2,400Hz tone. State changes can also be changes in the amplitude or phase of the signal. Each change of state is called a *symbol*. A modem using a 300-baud connection sends 300 distinct symbols per second.

Each symbol is composed of bits of information, and a single symbol can hold more than one bit. A standard 1,200-bps modem, for example, communicates at 600 baud, and encodes 2 bits per symbol. A 9,600-bps modem transmits at 2,400 baud, encoding 4 bits per symbol.

Here's an analogy: On an ordinary piano, label the first 64 keys with the binary values 00000000 (that would be 0 no matter how you spell it) through 11111111 (binary for 64). Now, phone a friend and hit one of the labeled keys. Assuming that your friend can distinguish the note you've played and knows your numbering scheme, he or she can decode 8 bits of information from the single note that you played. Modems use a similar principle, except they change from one "note" to another so fast it sounds more like white noise than individual tones.

A modem's maximum speed is limited by the characteristics of the telephone line. Typically, the upper limit for communication over a telephone circuit is 2,400 baud. Modern modems using advanced signal processing, however, routinely exceed this, allowing signals up to 3,200 baud on quiet lines. By using complex modulation schemes, they can pack up to 9 bits of information into each symbol.

Standards If you listen to a modem while it establishes a connection with another modem, you'll hear various beeps, tones, and squawks. This noise is the two modems trying to find a common "language." The noises are dictated by industry standards.

Every standard is different from every other, and all of them are quite complex. Here's a simple one: the Bell 212A. It's the U.S. 1,200-bps standard and is *full-duplex*: The bandwidth of the channel is divided into two parts and transmission can take place simultaneously in both directions. The originating modem (the name has nothing to do with who made the call) uses a carrier frequency of 1,200Hz. The answering modem (again, the name means nothing) uses a carrier of 2,400Hz. Once they connect, they communicate at 600 baud with two bits (a *dibit*) per symbol—1,200 bps.

And that's a *simple* standard.

Basically, if the modem you're trying to connect to doesn't understand those tones, then you have a problem. That's why the modem industry has standards (both de facto and committee-organized) that describe every aspect of a modem's signal.

The standards supported by a typical high-speed modem can be confusing, but they provide important information. Ultimately, they determine both the type of modems to which you can connect and how fast you can transfer data. The complete collection of International Telephone and Telegraph Consultative Committee (CCITT—it's French) and Electronic Industries Association (EIA) modem standards easily fills an entire bookcase. Fortunately, only a handful are significant for the typical PC modem.

- The V.32 standard provides speeds up to 9,600 bps—consider this the minimum acceptable. In most cases, you'll be better off if you insist on a V.32bis

FYI SIGNALING SPEEDS

Protocol	Top Speed (bps)
Bell 103	300
Bell 212A	1,200
V.22bis	2,400
V.32	9,600
V.32bis	14,400
V.32terbo	19,200
V.fast	28,800

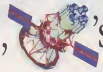
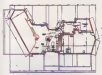
Modem Speeds: Are standards just so much alphabet soup? These are the signaling standards used by most modems today. By the time you read this column, V.fast should have evolved into an accepted standard called V.34.

BOTTOM LINE WHAT GOOD IS A FAST MODEM?

Service	Speed (bps)	Protocol	Compression/ Error Checking
CompuServe	14,400 (in most areas)	V.32bis	MNP 4
America Online	9,600	V.32	V.42 and MNP 1 to 5
Prodigy	9,600	V.32	V.42bis, V.42, and MNP 1 to 5
MCImail	9,600 (but should be 14,400 by the time you read this)	V.32	MNP 4 and MNP 5

Source: Service providers

Can't Connect: If you rushed out today and bought a V.32terbo or V.fast-class modem, you wouldn't see the higher performance on any of the popular online services. Above are the top speeds they support.

Yes, you can do Windows™ and walls and doors and floors, ceilings, whole 's, 's, trains, boats, 's, chains, 's, diamond rings, 's and things,  's, power plants, topo maps,  's, helicopters, roads and bridges, circuit boards, 's power lines, 's, airports, furniture, digital terrain models, 's, skateboards, the , 's, chemical plants, 's, golf courses, anything you can think of ... even the kitchen .

MicroStation. CAD software for Windows and Windows NT

Open yourself to a world of design possibilities with MicroStation CAD software. From 2D drafting to advanced 3D surface modeling, MicroStation Version 5 is the ultimate design tool for the Windows environment. And the most complete, with photorealistic rendering and animation. All in one package!

Join the many designers who have made the move to the CAD tool for the '90s.

Call 800-345-4856 for a free demo disk and brochure on MicroStation.

MicroStation
CAD *for the* '90s

INTERGRAPH

MicroStation models courtesy of Viewpoint Animation Engineering. Intergraph and the Intergraph logo are registered trademarks of Intergraph Corporation. MicroStation is a registered trademark of Bentley Systems Inc., an Intergraph affiliate. Other brands and product names are trademarks of their respective owners. © 1994 Intergraph Corporation. Huntsville AL 35894-0001 DD4014000

Circle 127 on reader service card.

WHAT OUR ENGINEERS HAD IN MIND WHEN WORKING ON OUR NEWEST SCANNER.

Introducing the Agfa StudioScan II.

Push a button, make a scan. Is it really that simple? With the new Agfa StudioScan II, it can be.

That's because StudioScan II was designed for simple operation. Two levels of scanning software are built in — easy-to-use Agfa FotoSnap and comprehensive Agfa FotoLook. Plus, our exclusive, 42-page *Introduction to Digital Scanning* will guide you through the scanning process.

What's more, every StudioScan II comes complete with Agfa FotoTune color management software and our IT-8 reference target, along with Adobe PhotoShop™ LE and OmniPage Direct™ OCR software. All in a 400 x 800 ppi, 30-bit, one-pass scanner. And all for about $1,000.

So if you want an easy way to bring a scanner into your office, all it takes is the new StudioScan II. And your finger. Call 1-800-685-4271 to find out more information on Agfa's new scanners.

AGFA

The complete picture.

AGFA and the Agfa rhombus are registered trademarks. Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in some jurisdictions. Omnipage Direct is a trademark of Caere Corporation.

Circle 168 on reader service card.

modem. The V.32bis standard extends V.32 up to 14,400 bps and is the prevalent high-speed standard. If communication with older modems is important, be sure that the modem also supports the V.22bis (2,400 bps) standard and the Bell 212A (1,200 bps) standard.

• If you find that 14,400 bps is too slow, the CCITT is currently developing V.fast (or V.34), which will provide speeds up to 28,800 bps on high-quality phone lines. Although some manufacturers have already produced so-called V.fast modems, the true standard (probably to be finalized as V.34) is still under development, and it may be some time before it is released and implemented in hardware.

• Because of the delay on V.34, some manufacturers have developed the V.32terbo pseudo-standard. By extending the technology described in V.32bis to encode more bits per symbol, V.32terbo claims to operate at speeds of 16,800 and 19,200 bps. Although it's been snubbed by the CCITT, several chip makers and dozens of manufacturers have lined up behind V.32terbo, including AT&T and National Semiconductor. And even though V.fast should be a standard by the time you read this, the modems will still be very expensive. That's why, if you need a fast modem immediately, you might want to buy a V.32terbo, which will probably be a bit less expensive.

• Unlike those described above, the V.42 and V.42bis standards don't indicate speed or modulation methods. Instead, they describe procedures and algorithms that perform error checking and data compression, respectively.

V.42 is an error-control protocol. If the receiving modem detects an error in the incoming data (using a *checksum*—a mathematical formula that can check data integrity), it can request that the originating modem retransmit the block. Unlike software protocols, such as Xmodem, the error and subsequent retransmission take place solely between modems; that means no CPU time is required, and your PC sees only error-free data.

The V.42bis standard describes a method of data compression in which outgoing data can be compressed to as little as 25 percent of its original size before transmission. The V.42bis standard requires that some form of error control (V.42, for example) be present as well. If you combine the maximum compression of V.42bis with the 14,400-bps top speed of a V.32bis modem, it's possible you'll see an effective transfer rate of 57,600 bps.

• Faxing is becoming a very popular option for modems, and support is usually described as either Class 1 or Class 2. A modem that conforms to the Class 2 standard makes far fewer demands on CPU time than a Class 1 modem does—this can be crucial in a multitasking environment. But beware: The Class 2 specification doesn't require that Class 1 commands be supported. Most fax software supports both Class 1 and Class 2 fax modems, but check before you buy either the modem or the software.

One Last Bit If you're still communicating at 1,200 or even 2,400 bps, a new modem can offer you a fourfold or higher increase in productivity. At a minimum, your modem should have V.32 or V.32bis compatibility with V.42 error control and V.42bis data compression. To maintain compatibility, make sure the modem supports the V.22bis and Bell 212A standards. For fax applications, it should also support the final EIA/TIA-592 Class 2 standard. And look for a modem that you can upgrade to V.fast (preferably through software) when it's ratified as a standard.

The final and most important attribute of a modem is quality. At their heart, most modern modems are built around very similar chip sets that are mass-produced by a relatively small number of manufacturers, including AT&T, National Semiconductor, and Rockwell. With one of these chip sets and just a few dozen additional components, anyone can produce a high-speed data and fax modem. But modems built with a minimum component count tend to offer minimum performance, often failing to connect at higher speeds or over noisy lines. The difference in price between apparently similar modems can be measured in lost productivity.

The types of modems available are sure to expand with the introduction of new standards and functions. Already appearing on the horizon as potential standard features are Class 3 fax and modems with integrated voice mail. Regardless of your needs, you're sure to find a modem that can fill them and a bit more.

ROBERT L. HUMMEL *is a contributing editor to* PC Computing *and author of* Programmer's Technical Reference: Data and Fax Communications *(Ziff-Davis Press, 1991). You can reach him c/o Help, PC Computing, 950 Tower Lane, 19th Floor, Foster City, CA 94404.*

FYI MAKE SENSE OF **COMPRESSION AND ERROR CHECKING**

Protocol	What It Does
V.42	Provides error control
V.42bis	Compresses data (about a 4:1 ratio)
MNP 4	Provides error control
MNP 5	Compresses data (about a 2:1 ratio)
MNP 7	Compresses data (about a 3:1 ratio)
T.4, T.6, and T.30	Describe the characteristics of Group 3 (digital) fax machines
EIA/TIA-578	Describes Class 1 fax modem commands
EIA/TIA-592	Describes Class 2 fax modem commands
SP2388	Preliminary (incompatible) version of EIA/TIA-592

Learned Letters: After signaling comes data-compression and error-control. Most common are V.42 and V.42bis, which go with the V.32 signaling standards. MNP is a widely used protocol from Microcom.

Finally, computer TV that doesn't insult your intelligence.

TECHNOLOGY INFORMATION

N E T W O R K

Two hours of television about computer products. Just for people like you.

This August, your hunt for information about the latest computer products and trends will change forever.

That's when you can turn on the Technology Information Network, four original, compelling weekly half hour TV shows that enable you to experience new products, see how they work, learn about their technical specs and features, and–best of all–buy the advertised products directly from us or via your local participating retailer.

Four programs, each with a unique focus

PC Update–news you can use about the latest products, trends, applications. Draws upon the industry's most knowledgeable experts including Ziff-Davis' own editors, for opinion, evaluations, advice.

Inside Technology–3 to 7 minute product and solutions-oriented segments which explain the technology and guide viewers in making product selections.

The Personal Computing Show–real-life examples of personal computer use for education, entertainment, enrichment and home office applications.

The Computer Outlet–offering a dozen or more products for sale at great prices. Purchase from your home via an 800# or through participating local retailers.

Produced by two of the greatest names in the computer industry

ZD Ziff-Davis Publishing

the leading provider of quality computer product information through magazines, newspapers, newsletters, books, CD-ROM products, on-line services, trade shows and conferences.

MISSINGLINK COMMUNICATIONS

an affiliate of Intelligent Electronics, Inc., the nation's largest supplier of computer products and services.

Every week starting August on CNBC, Jones Computer Network, America's Talking and many other stations.

Step into the Future with Everex STEP Note

Built-In Upgradability

Four steps to the perfect portable:
Step 1 - upgrade the CPU from 486SX-33 through IDX2-50 to Intel DX4-75
Step 2 - upgrade the display from mono STN through color DSTN to TFT
Step 3 - upgrade the removable hard disk from 120MB through 250MB and 340MB to 514MB
Step 4 - expand your options with fax/modem, Ethernet, SCSI and other PCMCIA cards

Road Ready Multimedia

Integrated digital audio chip set and sound generator lets you record, compress and play back. The Everex STEP Note includes built-in speaker and microphone, plus a jack for external ones.

Reliability & Service

The Everex STEP Note carries on the Everex tradition of reliability. We also include a 2 year warranty for additional peace of mind.

486SX mono starts at $1,495.
486SX color starts at $1,995.
Intel DX4-75 TFT starts at $3,495.

intel inside

5020 Brandin Court
Fremont, California 94538
Fax (510) 683-2186

Call **1-800-EVEREX4** (1-800-383-7394) for the location of the dealer nearest you.

EVEREX
EVER for EXcellence

MICROSOFT® WINDOWS™ NT

energy ALLY

2 YEAR WARRANTY

Circle 228 on reader service card.

The Intel Inside logo is a registered trademark of Intel Corporation. All other trademarks used herein are the property of their respective owners.

LASERLIKE SPEED AND RESOLUTION WITH COLOR TO BOOT

Color Ink Jet: Low-Cost Zip

So maybe deep down you don't like your clients. Why else would you force them to wade through a sea of gray graphs and charts? Give them a break: Give them color. Used judiciously color can clarify, emphasize, highlight, persuade, explain, cajole, celebrate—and sell. Best of all, you no longer have to ante up $4,500 and $1 per page to get it. Don't get us wrong—color thermal wax-transfer printers have their place, especially for continuous-tone images and complex graphics. But most of us simply need tightly registered hues in straightforward patterns at low costs. Today's business ink-jet printers are made to order for such applications.

If you haven't looked at a color ink jet printer in the last year or so, you're in for a surprise. Business ink jets have overcome the drawbacks that still plague personal and low-end models. They now use 104-nozzle print cartridges (personal ink jets use 50-nozzle cartridges) that provide sharper images across a wider range of papers and transparencies. Look for the same 300-by-600-dot-per-inch output you'd expect from a monochrome laser printer.

Print performance has been greatly enhanced as well. Better ink jets produce laserlike speeds of 6 pages per minute for black-and-white output, and 1 to 2 minutes per page for color. Look for a draft or fast mode for rush jobs. Some ink jets feature as many as three modes, allowing you to choose the quality/performance trade-off you prefer.

Improved performance comes from RISC processors that are now standard in business ink-jet printers and from heated paper paths, which dry the ink faster so that it doesn't smudge. Faster-drying ink also allows the print head to make multiple passes on the page for tighter color registration.

As with any business printer, you'll want your ink jet to support PCL 5. PostScript Level 2 should be an upgrade option in case you later need it.

If the ink jet is your sole printer, you'll need 4MB of RAM—on a network, get at least 8MB. The cartridge for black should have a larger ink reservoir than those for cyan, magenta, and yellow. Be sure to ask for a list of third-party manufacturers of ink cartridges.

MARTY JEROME

COLOR INK JET

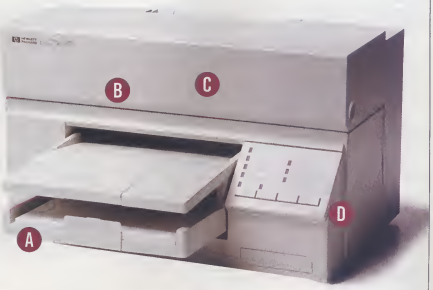
IT'S EASY TO GET **HIGH RESOLUTION** AND **PERFORMANCE**

A. Speed: Six pages per minute for black-and-white documents; 1 to 2 minutes per page for color.

B. Resolution: 300-by-600-dpi for "quality" mode, but look for a draft mode as well.

C. Cartridges: In addition to the standard cyan, magenta, and yellow cartridges, black has its own larger cartridge. Each cartridge has 104 nozzles.

D. RAM: 4MB for personal use; 8MB or more for network use.



Interface: Network option in addition to high-speed parallel interface with auto-switching between the two.

Fonts and printer language: PCL 5 built-in with PostScript Level 2 option; at least 25 internal fonts, 10 TrueType.

Other features: Fast-drying ink is now available, as are heated paper paths, which make slow-drying ink solid in an instant.

Direct to You ADVERTISERS' INDEX

VENDOR NAME	PAGE NO.	HOURS OPEN	800 NUMBER
SYSTEMS			
ACER	267-71	M-F 6-6; Sat 8-4 (PST)	800-230-ACER
Computer Discount Warehouse	301-2,305	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Insight	286	24 Hours	800-927-3159
Midwest Micro	306-13	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	287-9	M-F 24 Hours; Sat-Sun 10-8 p.m.	800-598-4727
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
Quantex Microsystems	277-81	M - Sat 9-9	800-787-8686
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
VTech/Expotech	296-9	M-F 7-8:30; Sat 9-6; Sun 10-3 (EST)	800-819-0070
PERIPHERALS			
AMDEK	316	M-F 8:30-8:30	800-72-AMDEK
Arlington Computer Products	272	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Computer Discount Warehouse	301-2,305	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Envisions	320-1	M-F 6:30-5; Sat 9-1 (PST)	800-926-7226
First Source International	292	M-F 8-5; Sat 9-3 (PST)	800-474-9866
Insight	286	24 Hours	800-927-3159
L.A. Trade	276	M-F 8-5; Sat 10-12 (PST)	800-433-3726
Megahaus	282	M 8-8; TU-F 8-7; Sat 9-3(CST)	800-786-1187
Midwest Computer Works	266	M-F 8-7 CST	800-65-WORKS
Midwest Micro	306-13	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	287-9	M-F 24 Hours; Sat-Sun 10-8 p.m.	800-598-4727
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
PRINTERS			
Arlington Computer Products	272	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Midwest Computer Works	266	M-F 8-7 (CST)	800-65-WORKS
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
SOFTWARE			
American Small Business Computers	317	M-F 8-5:30	918-825-4844
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Computer Discount Warehouse	301-2,305	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
First Source International	292	M-F 8-5; Sat 9-3 (PST)	800-474-9866
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
MEMORY			
First Source International	292	M-F 8-5; Sat 9-3 (PST)	800-474-9866
L.A. Trade	276	M-F 8-5; Sat 10-12 (PST)	800-433-3726
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
WorldWide Technology	318	M-F 9 -7:30; Sat 10-6	800-457-6937
NOTEBOOKS			
Altima	319	M-F 8-5 (PST)	800-356-9990
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Insight	286	24 Hours	800-927-3159
Midwest Computer Works	266	M-F 8-7 CST	800-65-WORKS
Midwest Micro	306-13	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	287-9	M-F 24 Hours; Sat-Sun 10-8 p.m.	800-598-4727
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
SAGER	314-15	M-F 7-6; Sat 9-3 (PST)	800-669-1624
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
STORAGE			
Insight	286	24 Hours	800-927-3159
First Source International	292	M-F 8-5; Sat 9-3 (PST)	800-474-9866
TRAINING PROGRAMS			
Computer Book Club	295	M-F 8-5	717-794-2191
Int'l Correspondence Schools	275	24 Hours	800-596-5505
NRI Schools	285	M-F 8-5 (EST)	202-244-1600

Direct to You

SPEC WATCH:
Don't Settle for Less than These Specs

NETWORK **SERVERS**

CPU: Intel 486DX2/66, 486DX4, or Pentium.

RAM: 16MB, expandable to 128MB.

CPU RAM cache: 256K.

Display: 14-inch Super VGA color or monochrome.

Video card: Super VGA with 512K of RAM.

Hard drive: 1GB SCSI-2.

Bus: Eight EISA slots with two VL-Bus or PCI.

Drive bays: Two full-height 5¼-inch, two half-height 5¼-inch with front-panel access, two 3½-inch.

Features and options: RAID-5, DAT backup, uninterruptible power supply, dual-speed CD-ROM drive, built-in SCSI-2 controller, Ethernet controller, protected power switch to prevent accidentally turning the power off.

Other requirements: FCC Class A or better, UL listed.

RED FLAGS: Systems with ISA bus or slotted RAM are less upgradable. Database and other application servers need more CPU power than a file server.

MIDRANGE **DESKTOP** SYSTEMS

CPU: Intel 486DX2/66, 486DX4, or Pentium.

Secondary cache: 256K four-way set-associative.

Memory: 8MB, expandable to 32MB, 36-pin SIMMs.

Floppy drive: 3½-inch.

Hard drive: 400MB or larger IDE or SCSI-2.

Video: VL-Bus or PCI Windows accelerator, 15-inch monitor or larger with 72Hz refresh at 1,024 by 768 pixels.

Slots: Eight ISA slots for full-sized case (including two VL-Bus or PCI), three ISA slots for small-footprint case with integrated VL-Bus or PCI video and drive.

Drives and bays: One 3½-inch 1.44MB and one 5¼-inch 1.2MB floppy drive, five half-height 5¼-inch bays.

Features and options: Dual-speed or faster CD-ROM drive, sound card or built-in sound capability, two parallel ports, two COM ports, and keyboard and mouse ports.

RED FLAGS: Watch for Pentium-upgradable systems that don't include a ZIF socket, secondary CPU cache, or lots of slots for extra RAM.

PC Computing

PROFESSIONAL DISCOUNT ORDER FORM

ANNUAL COVER PRICE	REGULAR SUBSCRIPTION PRICE	YOUR PROFESSIONAL ONE-YEAR RATE	BONUS STATUS
$35.40	$24.97	$16.94	FREE 1001 Windows™ Hints & Tips Software

As a professional involved with computers, you are entitled to a reduced rate on PC/Computing. Return this form to receive PC/Computing for up to 58% off the newsstand price. BONUS: The 1001 Windows Hints & Tips disk -- FREE with your paid subscription.

Check one: ☐ 1 year (12 issues) for $16.94—SAVE 52%
☐ 2 years (24 issues) for $29.94—SAVE 58%

Name (Please Print) 4SDF5

Company

Address

City State Zip

REPLY REQUESTED

☐ Payment enclosed. ☐ Bill me later.

RETURN THIS FORM TO GUARANTEE SAVINGS.

Basic one-year subscription $24.97; on newsstands $35.40. Canada and foreign add $16.00 per year. U.S. funds only. Canadian GST included. Please allow 30 days for shipment of first issue. FREE software will be sent upon payment.

Direct to You ADVERTISERS' INDEX

VENDOR NAME	PAGE NO.	HOURS OPEN	800 NUMBER
SYSTEMS			
ACER	267-71	M-F 6-6; Sat 8-4 (PST)	800-230-ACER
Computer Discount Warehouse	301-2,305	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Insight	286	24 Hours	800-927-3159
Midwest Micro	306-13	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	287-9	M-F 24 Hours; Sat-Sun 10-8 p.m.	800-598-4727
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
Quantex Microsystems	277-81	M - Sat 9-9	800-787-8686
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
VTech/Expotech	296-9	M-F 7-8:30; Sat 9-6; Sun 10-3 (EST)	800-819-0070
PERIPHERALS			
AMDEK	316	M-F 8:30-8:30	800-72-AMDEK
Arlington Computer Products	272	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Computer Discount Warehouse	301-2,305	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Envisions	320-1	M-F 6:30-5; Sat 9-1 (PST)	800-926-7226
First Source International	292	M-F 8-5; Sat 9-3 (PST)	800-474-9866
Insight	286	24 Hours	800-927-3159
L.A. Trade	276	M-F 8-5; Sat 10-12 (PST)	800-433-3726
Megahaus	282	M 8-8; TU-F 8-7; Sat 9-3(CST)	800-786-1187
Midwest Computer Works	266	M-F 8-7 CST	800-65-WORKS
Midwest Micro	306-13	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	287-9	M-F 24 Hours; Sat-Sun 10-8 p.m.	800-598-4727
PC Zone	290-1	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386
USA Flex	300	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
PRINTERS			
Arlington Computer Products	272	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	317	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Midwest Computer Works	266	M-F 8-7 (CST)	800-65-WORKS
[illegible]	[illegible]	M-F 5am-11pm, Sat-Sun 5am-8pm	800-252-0386

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 66 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC Computing

P.O. Box 50253
Boulder, CO 80321-0253

NETWORK SERVERS

CPU: Intel 486DX2/66, 486DX4, or Pentium.

RAM: 16MB, expandable to 128MB.

CPU RAM cache: 256K.

Display: 14-inch Super VGA color or monochrome.

Video card: Super VGA with 512K of RAM.

Hard drive: 1GB SCSI-2.

Bus: Eight EISA slots with two VL-Bus or PCI.

Drive bays: Two full-height 5¼-inch, two half-height 5¼-inch with front-panel access, two 3½-inch.

Features and options: RAID-5, DAT backup, uninterruptible power supply, dual-speed CD-ROM drive, built-in SCSI-2 controller, Ethernet controller, protected power switch to prevent accidentally turning the power off.

Other requirements: FCC Class A or better, UL listed.

RED FLAGS: Systems with ISA bus or slotted RAM are less upgradable. Database and other application servers need more CPU power than a file server.

MIDRANGE DESKTOP SYSTEMS

CPU: Intel 486DX2/66, 486DX4, or Pentium.

Secondary cache: 256K four-way set-associative.

Memory: 8MB, expandable to 32MB, 36-pin SIMMs.

Floppy drive: 3½-inch.

Hard drive: 400MB or larger IDE or SCSI-2.

Video: VL-Bus or PCI Windows accelerator, 15-inch monitor or larger with 72Hz refresh at 1,024 by 768 pixels.

Slots: Eight ISA slots for full-sized case (including two VL-Bus or PCI), three ISA slots for small-footprint case with integrated VL-Bus or PCI video and drive.

Drives and bays: One 3½-inch 1.44MB and one 5¼-inch 1.2MB floppy drive, five half-height 5¼-inch bays.

Features and options: Dual-speed or faster CD-ROM drive, sound card or built-in sound capability, two parallel ports, two COM ports, and keyboard and mouse ports.

RED FLAGS: Watch for Pentium-upgradable systems that don't include a ZIF socket, secondary CPU cache, or lots of slots for extra RAM.

SUBNOTEBOOK PCS

CPU: Intel 33MHz 486SX.

Display type: 7¼-inch backlit passive, dual-scan passive, or active-matrix LCD.

Weight: 4 pounds or less.

Size: Smaller than 8½ by 11 by 2 inches.

Keyboard: 85 percent of full-sized keyboard.

RAM: 4MB, expandable to 16MB.

Hard drive: 80MB or larger.

Features and options: Removable hard drive, high-speed internal fax modem, integrated pointing device, infrared keyboard connection.

Other requirements: External floppy, at least one PCMCIA Type II slot, small recharger (5½ by 3 by 1¼ inches or smaller).

RED FLAGS: Subnotebook displays and keyboards entail compromise—try before you buy, or make sure there's a money-back guarantee with no restocking charge. In addition, many subnotebook batteries run down quickly, particularly when you're using color. Make sure the battery is easy to replace. User-installable RAM is also a plus.

NOTEBOOK PCS

CPU: 33MHz 486.

Display type: 9½-inch or larger backlit dual-scan passive- or active-matrix color LCD with accelerated local bus. Look for adjustable contrast and brightness controls.

Weight: Less than 7 pounds without AC adapter; total traveling weight less than 9 pounds.

Size: Smaller than 10 by 12 by 2 inches.

RAM: 8MB, expandable to 20MB.

Hard drive: 120MB.

Ports/slots: Parallel, 9-pin serial, PS/2 ports; one PCMCIA Type III slot or two Type II slots.

Features and options: Ability to swap out floppy drive for second battery, removable hard drive, user-installable RAM, integrated pointing device. Pen pointing device and touch screen can be useful in some instances. Look for notebooks that support new Duracell standard-sized rechargeable batteries.

Other requirements: Standby mode, pop-up battery gauge, 6-by-3-by-3-inch (or smaller) battery recharger.

MIDWEST COMPUTER WORKS

YOUR COMPLETE COMPUTER SOURCE!!!

✓ Widest Selection ✓ Top Name Brands ✓ Quality Products ✓ Knowledgeable Sales Staff

TEXAS INSTRUMENTS

Only $4449

75MHz Color 455MB
- IntelDX4™/75 processor
- Large 9.4" Active Matrix Color display
- 4MB RAM, expandable to 20MB, 455MB HD
- Microsoft BallPoint® with QuickPort™ connection

TravelMate™ 4000E WinDX4™/75

Only $3989

75MHz Color 340MB
- IntelDX4™/75 processor
- 640x480 VGA Active Matrix Color display
- 4MB RAM, exp. to 20MB, 340MB hard disk drive
- Microsoft BallPoint® with QuickPort™ connection

TravelMate™ 4000E WinDX4™/75

HARDWARE

BATTERY BACKUPS

American Power BK250B / BK400B	97/149
American Power BK450 / BK600	185/249
American Power BK900	359
American Power BK1250	485
American Power AP400	279
American Power AP600 SmartUPS	339
American Power AP900 SmartUPS	489
American Power AP900NET SmartUPS	539
American Power AP1250 SmartUPS	619
American Power AP2000NET SmartUPS	1079
American Power UPS 220V Models	CALL
Tripp Lite BC250 / BC400	95/145
Tripp Lite BC500 / 500 LAN	173/179
Tripp Lite BC600 LAN / 750 LAN	229/289
Tripp Lite BC900 LAN / 1250 LAN	339/439
Tripp Lite Omni 500 LAN / 600 LAN	239/275
Tripp Lite Omni 750 LAN / 1250 LAN	336/545
Tripp Lite LC1200 / LC1600	139/187

COMPUTERS

AST Bravo LP 486SX/33170MB	1189
AST Premmia 486DX2/50 340MB 8MB	2199
AST Premmia LX Pentium 60 270MB 8MB	2699
Compaq Prolinea 486SX/50 200MB	1259
Compaq Prolinea 486DX2/50 200MB	1439
Compaq Prolinea SX/33 200MB CD-ROM	1539
Compaq Prolinea 486DX4/100 525MB	2499
Compaq DeskproXE 560 P60 525MB	3019
Compaq Prolinea NET1 Series	BEST PRICES
Compaq Prolinea MT Mini-Towers All Models	CALL
Compaq PROLIANT All Models	BEST PRICES
Compaq Prosignia VS Series	BEST PRICES
Wyse Terminals	CALL FOR PRICNG

CONTROLLERS

Adaptec AHA-1522A Single SCSI-2 ISA	75
Adaptec AHA-1542 SCSI-2 ISA w/Flpp	195
Adaptec AHA-2742 SCSI-2 EISA w/Flop	295
Adaptec AHA-2842 SCSI-2 VESA w/Flop	249
Adaptec AHA-2940 PCI SCSI Master	289
Boca IDE 2-HDD 2-FDD ide002	35
Boca IDE 2-HDD 2-FDD 2-ser 1-par	49

MATH CO-PROCESSORS

Cyrix 386 to 486 CPU Upgrade	CALL
Cyrix Match Co-processors All Models	63
Intel 486SX 25 to 50 Overdrive	195
Intel 486DX 33 to 68 Overdrive	315
Intel Match Co processors All Models	CALL

Easy Payment Methods!
- Purchase orders accepted from educational institutions, federal & state agencies and approved corporations.
- All major credit cards accepted.
- C.O.D's welcome

Policy Information

• Your credit card is not charged until the merchandise is shipped • Personal and company checks will delay orders 2-weeks • No extra charge for credit cards • All prices subject to change • For orders outside the USA we require payment by wire transfer or American Express credit card • We check for stolen credit cards • All returns for credit, repair or exchange must have a return authorization number issued by our customer service department • All returned merchandise must be shipped to our main warehouse located at: 180 Lexington Drive, Buffalo Grove, IL 60089

HARDWARE

SCANNERS

Avec 2400 Designer	599
Hewlett Packard Scanjet 2P greyscale	499
Hewlett Packard Scanjet 2CX Color	969
Microtek Scanmaker II G w/OmniScan b&w	385
Microtek Scanmaker II XE clr w/Photoshop LE	879
Microtek II SP color w/ Adobe Photoshop LE	749
Microtek II HR High Resolution color	1009
Microtek Scanmaker III 36-bit	2449
Mustek Color Artist Handheld	279
Relisys 2412 PC Clr Flatbed w/Photoshop	749
Umax UC630 w/Photoshop LE/OmniPage	599
Umax UC840 w/Photoshop LE/Omnipage	772

DRIVES

Conner CFS210A 210MB 14ms IDE	193
Conner CFS420A 426MB 14ms IDE	263
Conner CFA540A 528MB 12ms IDE	346
Conner CFIP 1060S 1.0GB 9ms SCSI	743
IomegaTransportable Pro 90 EXT	350
Iomega Multidisk 150 PC Power EXT	479
Maxtor 7345A 345MB IDE	259
Maxtor 7546A 546MB 12ms IDE	349
Micropolis 2210A 1GB 10ms IDE	738
Micropolis 2217 1.7GB 10ms SCSI-2	989
Micropolis 1928 2.1GB 11ms SCSI-2	1399
Seagate ST3243A 214MB 16ms IDE	193
Seagate ST3290A 260MB 16ms IDE	225
Seagate ST3391A 341MB	253
Seagate ST3550A 452MB 12ms IDE	319
Seagate ST3655A 529MB 12 msID	359
Seagate ST31200N 1GB 9ms SCSI-2	767
Seagate ST12400N 2.1GB 9ms SCSI-2	1324
SyDos Extra 88MB Rmvbl 88i int / 88E ext	399/459
Syquest 240MB External	689
Teac FD505 dual floppy drive	119
Teac / Toshiba Floppies ALL	55

MODEMS

Boca Pocket Modem 14.4 w/Fax	159
Boca VOICE Modem 14.4	149
Boca VFAST 28.8 int / ext.	186/221
Hayes Acura 144+ FAX/SCEZ int	122
Hayes Optima 14.4 + FAX14.4 EZ ext	369
Intel **PCMCIA** 24/96 tax/modem	123
Intel Satisfaxtion 400 int / ext	273/309
Megahertz modems for all laptops	CALL
Megahertz XJ144 xJack 14.4 **PCMCIA**	216
Microcom Deskporte ES 14.4	175
Microcom Deskporte Fast ES 28.8	229
Microcom Deskporte Fast EP 28.8	307
Multitech 1432MU 14.4 fax/modem pocket	369
Multitech 1432BA 14.4 fax/modem ext	409
Practical Periph 14.4 w/fax internal	109
Practical Periph 14.4 w/fax mini tower	127
Supra 14.4 S/R Fax int	115
Supra Fax Modem 14.4LC ext	135
Telebit QBlazer v.32 v.42 v.42bis trnspt	All Models
UDS Internal & external ALL MODELS	CALL
US Robotics Sportster 14.4 w/fax int	118
US Robotics Sportster 14.4 w/fax ext	135
US Robotics Sportster 28.8 w/fax int / ext	209/229
Courier V.32 Turbo 19.2 w/fax int / ext	329/357
Courier V.34 Ready Data/Fax Int	397
US Robotics Worldport pocket modems	CALL
US Robotics Worldport 14.4 **PCMCIA**	189
Zoom VFP 19.2 / VFP24K Fast int w/fax	139/144
Zoom VXV32BIS 14.4 v32/32bis/42bis ext	129

TAPE BACKUP

Colorado DJ-20 250MB	165
Colorado Trakker 250MB	315
Colorado PT-25 2GB SCSI w/controller int	939
Conner CS2000 2gig int	1239

DIGITIZERS

Calcomp 12x12 / 12x18 w/16-button	279/558
Kurta 12x12 XTG / 12x18 XGT	199/419
Summasketch III 12x12 / 12x18 Pro	279/479
Summasketch Summagrid IV 24x36	1149
Wacom ArtZ 6x8 / 6x9	332/445

PLOTTERS

Calcomp Designmate 30245	1479
HEWLETT PACKARD	ALL MODELS
Pacific Data Pro Tracer II	1029

VIDEO BOARDS

ATI Graphics Wonder Mach32 1MB ISA/VLB	121
ATI Graphics Ultra+ 2MB ISA	199
ATI Graphics Ultra Pro 2MB VLB/PCI	270
ATI Graphics Pro Turbo 2MB ISA/VLB/PCI	378
ATI Graphics Pro Turbo 4MB ISA/VLB/PCI	589
Diamond Speedstar Pro 1MB ISA/VLB	109
Diamond Stealth Pro 1MB / 2MB ISA/VLB	219/299
Diamond Viper 2MB Local Bus	329
Diamond Viper 2MB PCI	357
Matrox MGA-Ultra 2MB ISA/VESA	489
Matrox MGA-IMP3V 3MB VLB	689
Matrox PCI/2 1280 2MB PCI	372
MediaVision Pro 4MB 1280VLB	699
Number Nine GXE VLB Level 11 / 12	349/419
Number Nine GXi TC Level 29	1449

NOTEBOOK COMPUTERS

AST Bravo NB486SX33 200MB mono	1617
AST Bravo NB486SX25 170 Active Clr	2959
AST Bravo NB486SX25 200 STN Color	2264
Canon Notejet 486 M33/200MB	1899
Canon Notejet 486 C33/200MB Color	2499
Canon Notejet 486 C50/130MB Color	2729
Canon Notejet 486 C50/260MB Color	2929
Compaq Concerto 486SL/25 250MB	1349
Compaq Concerto 486SL/33 250MB	1449
Contura AERO 486SX25 170MB Mono	1449
Contura AERO 486SX33 170MB STN Clr	2019
Contura AERO 486SX33 250MB STN Clr	2308
Compaq Contura 4/25 120MB	1729
Compaq Contura 4/25 209MB	1999
Compaq Contura 4/25C 120MB Color	2099
Compaq Contura 4/25C 209MB Color	2379
Compaq ELITE 486DX2/40 170MB STN Clr	3219
Compaq ELITE 486DX2/40 170MB TFT Clr	3895
Compaq ELITE 486DX2/40 340MB TFT Clr	4289
Compaq ELITE 486DX2/50 340MB TFT Clr	5159
Compaq ELITE 486DX4/75 340MB 8MB TFT Clr	5869
Compaq ELITE 486DX4/75 510MB 8MB TFT Clr	6359
TI TM4000E WinSX25 Psv Clr 120MB	1729
TI TM4000E WinDX2/40 Color 200MB	2129
TI TM4000E WinDX2/50 Mono 200MB	2289
TI TM4000E WinDX2/50 Psv Clr 200MB	2376
TI TM4000E WinDX2/50 Actv Clr 200MB	2886
TI TM4000E WinDX4/75 Actv Clr 340MB	3989
TI TM4000E WinDX4/75 Actv Clr 455MB	4449
TI TM4000M 486SL/25 Mono 120MB	1929
TI TM 4000M 486SL/25 Psv Clr 120MB	2237
TI TM4000M 486SL/25 Actv Clr 200MB	3099
TI TM4000M 486DX4/75 Actv Clr 340MB	4959
Toshiba T1910 486SX-33 200MB	1499
Toshiba T1910CS 486SX-33 200MB Color	2039
Toshiba T1950 486DX2/40 Mono 120MB	1723
Toshiba T1950 CS STN Color 200MB	2319
Toshiba T1950 CT TFT Color 200MB	2929
Toshiba T1960 CS 4/50 200MB STN Clr	2399
Toshiba T1960 CT 4/50 200MB TFT Clr	3029
Toshiba T1960 CT 4/50 320MB TFT Clr	3299
Toshiba T2400 CS 4/50 250MB STN Clr	2959
Toshiba T3400 486SX-33 Mono 120MB	1934
Toshiba T3400CT 486SX-33 Color 120MB	3399
Toshiba T4700CS 486DX2-50 200/340MB Clr	CALL
Toshiba T6600C 486DX2-66 510MB 8MB Clr	6099

MONITORS

ADI MicroScan 2E 14" 800x600 ni .28mm	260
ADI McrScn 3E / 3G 14" ni .28mm	295/339
ADI MicroScan 4G 15" 1280x1024 ni .28mm	409
ADI MicroScan 5A 17" 1280x1024 ni .26mm	799
CTX 14" 1024X768 .28mm	239
CTX 14" 1024x768 ni .28mm MPRII	259
CTX 15" 1280x1024 ni .28mm	349
CTX 15" 1280x1024 ni .28 Low Radiation	359
CTX 17" 1280x1024ni .28 Digital	699
Goldstar 1455DL 14" 1024x768 .39mm	209
Goldstar 1460DL 14" 1024x768 .28mm	239
Idek MF-5315 15" 1024x768 ni .28mm	439
Idek MF-8617 17" 1280x1024 ni .28mm	799
Idek MF-8217 17" 1280x1024 ni .28mm	849
Idek MF-8221 21" 1600x1200 ni .28mm	1899
Idek MF-8421 21" 1600x1200 ni .26mm	1979
Idek MF-8621 21" 1600x1200ni .26mm	2299
Mag DX15F 1280x1024 .28mm	389
Mag DX17F 17" 1280x1024ni .26mm	699
Mag MX17F 1280x1024 .26mm	829
Mitsubishi Diamond Scan 17" 1280x1024	949
Mitsubishi Diamond Scan 20" 1024x768	1549
Nanao F340iW 15" 1024x768 .28mm	648
Nanao F550i/F550iW 17" .28mm	948/1038
Nanao F560iW 17" 1280x1024 .26mm	1299
Nanao T560i 17" 1280x1024 .25mm	1499
Nanao T660i 20" 1280x1024 .30mm	2099
Nanao F760iW 21" 1280x1024 .28mm	1975
Nanao F780iW 21" 1600x1200 .26mm	CALL
NEC 3FGE / 3V 15" 1024x768 .28mm	559/466
NEC 4FGE 15" 1024x768 .28mm	619
NEC 5FGE / 5FGP 17" 1280x1024 .28mm	969/1096
NEC 6FGP 21" 1280x1024 .28mm	1979
Optiquest 2000 DS 15" 1024x768 .28mm	389
Optiquest 2000 DC 15" 1280x1024 .27mm	429
Optiquest 4000 DC 17" 1280x1024 .27mm	749
Optiquest 4000 TC 17" Trinitron .25mm	829
Sony CPD15SF1 15" 1280x1024 .25mm	439
Sony CPD1730 17" 1024x768 .25mm	859
Sony GDM-17SE1 17" 1600x1280 ni	965
Sony GDM 2036S 20" 1280x1024 .30mm	1859
Sony GDM 2038 1600x1200 20" .30mm	1969
ViewSonic V6E 14" 1024x768ni .28mm	299
ViewSonic V15E 15" 1024x768 .28mm	379
ViewSonic V17G 17" 1280x1024ni .28mm	839
ViewSonic V21 1600x1280ni .25mm	1799

NETWORKING

3COM 3C503 Etherlink II 16 bit coax/10BT	155
3COM 3C509 Etherlink III coax/10 BT	115
3COM 3C509 Etherlink III coax 5-pack	499
3COM 3C509TP Etherlink III 10baseT 5-pack	499
3COM 3C509 Combo Etherlink III coax & 10BT	135
3COM 3C529 Etherlink III PS/2 coax	226
3COM 3C529TP Etherlink III PS/2 10baseT	226
3COM 3C579 Etherlink III EISA coax	226
3COM 3C579TP Etherlink III EISA 10BaseT	226
3COM 3C589TP Etherlink III **PCMCIA** 10BT	189
3COM 3C589C Etherlink III **PCMCIA** Combo	237
3COM 3C16271 12-Port Link Builder 10BaseT	818
Artisoft Central Station 2	389
Artisoft Noderunner 2000/C coax / 2000/T 10BT	169
Artisoft Noderunner/SI 2000/T 10BT	85
Artisoft Noderunner 2000/A Combo	219
Artisoft V6.0 Starter Kit	309
Artisoft Artcom LAN Modem Software	265
DIGIBOARD ALL MODELS	CALL
Eagle NE2000+ Ethernet 16 bit coax	89
Eagle NE3200 Combo 32 bit EISA	369
Intel Ether Express 16-bit coax/10BT	99
Intel Ether Express 16 combo	116
Intel Ether Express Flash 10BT	111
Intel Ether Express EISA 32-bit coax	409
Intel Token Express 16/4 ISA	349
National Semi NE2000+ coax	89
National Semi NE2000+ 1[illegible]	85
National Semi NE4100T P[illegible]	168
Netware 3.12 5-user	549
Netware 3.12 10-user	1249
Netware 3.12 25-user	1849
Netware 3.12 50-user	2465
Netware 3.12 100-user	3479
Netware 3.12 250-user	CALL
Netware SFT III 3.11 BEST PRICE	CALL
Netware V4.01 5-user / 10-user	719/1619
Netware V4.01 25-user / 50-user	2419/3249
Netware V4.01 100-user / 250-user	4549/8869
Netware V4.01 500-user / 1000-user	CALL
NETWARE UPGRADES	BEST PRICE
Novell DOS 7.0/Personal Netware	69
Novell Personal Netware 5-user	259
Pacific Data Direct Net 10-Bit ENET	279
Pacific Data Direct Net EX	449
SMC Arcnet PC130 / PC270E	68/108
SMC Arcnet PC600WS wrkstn / PC650FS srvr	119/198
SMC Arcnet 8-port Coax Active Hub	225
SMC Ethercard+ Elite 16-bit coax	119
SMC Ethercard+ Elite 16T 16-bit 10base-T	119
SMC Ethercard+ Elite 16-bit PS/2 10baseT	184
SMC Ethercard+ Elite 16-bit Combo	134
SMC Ethercard+ Elite 32-bit EISA coax	599
SMC Ethercard+ Elite 32-bit EISA 10baseT	589
SMC Elite 16 Ultra Ethernet coax	99
SMC Elite 16T Ultra Ethernet 10baseT	99
SMC Elite 16C Ultra Ethernet Combo	118
SMC Ethernet 8-port 10BaseT Concentrator	324
SMC Ethernet 12-port 10BaseT Concentrator	579
Thomas Conrad 6242 Arcnet 8-bit	66
Thomas Conrad 6245 Arcnet 16-bit	176
Thomas Conrad 3045 STP 100 mbps	448
Thomas Conrad 3045-CX 100mbps coax	448
Thomas Conrad 3045ST 100mbps fiber	704
Thomas Conrad 3047 CX 100mbps EISA	599
Thomas Conrad 3050 STP 8-port Hub	1168
Xircom Pocket Arcnet coax	229
Xircom Pocket Arcnet twisted pair	229
Xircom Pocket Ethernet coax	269
Xircom Pocket Ethernet 10baseT	269
Xircom Pocket Token Ring Adapter	455
Xircom Pocket Ethernet Print Server coax	299
Xircom Pocket Ethernet Print Server 10baseT	289
Xircom Parallel Port Multiplexor	78
Xircom Credit Card Enet 16-bit coax or 10bT	259

Novell Gold Authorized Reseller

MULTIMEDIA

MULTIMEDIA

Creative Labs Digital Edge 3X CD-int	689
Creative Labs Discovery 16 int	315
Creative Labs Omni CD int.	205
Creative Labs Gameblaster CD int bundle	375
Creative Labs Edutainment16 Int	412
MediaVision MV-2000 Family Deluxe	325
MediaVision MV-3000 Super Deluxe	380
MediaVision MV-4000 Premier ext.	499
MediaVision Pro Deluxe Edition MV5000	670
MediaVision Pro 16 Multimedia III	665
MediaVision Memphis ext CD-ROM Kit	379
Sony CDU33 A/N Starter Kit int	229
Sony CDU33 A/L Mltimdia Kit Int	469
Plextor 3028-MVPAS 16 Bundle int.	419
Turtle Beach Multisound upgrd	1221
Turtle Beach Monterey Multi Media upgrd	689

VIDEO CAPTURE

Creative Labs Video Blaster SE	269
Creative Labs Video Spigot	237
Creative Labs Video Blaster FS 2000	237
MediaVision ProMovie Studio	179
TrueVision Video VGA16	760
TrueVision Targa+ 16 / 64	1089/1569

CD-ROM DRIVES

Chinon CDS535 220ms SCSI-2 int	329
Chinon CDS535 220ms w/contrl	349
MediaVision Reno 180ms ext	279
NEC 3XP CDR-400 portable	399
NEC 3XI CDR-500 int / 3XE CDR-600 ext	429/469
NEC CDR-900 external 4X	929
Plextor 3028 int 240ms	265
Plextor 4Plex Quad Speed	489
Sony CDU-33A01 int dbl speed Bare	149
Sony CDU-33A01 Kit	199
Sony CDU-561 295ms SCSI int	279
Sony CDU7811 295ms SCSI ext	419
Toshiba TXM-4101 ext	285
Toshiba TXM3401P - Portable	489

OPTICAL DRIVES

Pinnacle Tahoe 128MB ext	982
Pinnacle Sierra 2.6GB PC ext	5445
Pinnacle PMO-650MB ext Rewrite	3045
Pinnacle Recordable CD-ROM Int/ext	3489/3662
PLI Infinity Floptical 3.5"44mb int	288
PLI Infinity 3.5" 200 int	550
Sony SMOE301F 128MB int 40ms	999
Sony SMOF521 1.3GB int 40ms	2049

SOUND BOARDS

MediaVision ProAudio Spectrum 16	95
MediaVision ProAudio Studio16	122
Media Vision Premium 3-D SCSI2	139
Orchid Gameware 32	119
Orchid Soundwave 32	165
Sound Blaster Pro Value Ed	78
Sound Blaster 16 Value Ed	99
Sound Blaster AWE 32	264
Sound Blaster 16 MCD	139
Sound Blaster 16 ASP MCD	169
Sound Blaster 16 SCSI 2 ASP	205
Wave Blaster Daughter Brd	179
Turtle Beach Deytona **PCMCIA**	385
Turtle Beach Multisound Tahiti	242
Turtle Beach Monterey	329
Turtle Beach Audio Adv **PCMCIA**	124
Wavjammer 16-bit Stereo **PCMCIA**	245

SPECIALS

- 1280x1024 NI
- Opti-Coat™ Screen Treatment
- On-Screen Display Programming
- VESA® (DPMS)™ and MPR-II
- Invar Shadow Mask

Only $749

SOFTWARE

DesignCAD 2D for Windows!

Within minutes you can turn your ideas into precise designs! DesignCAD comes complete with 500 symbols, dimensioning, drafting and editing toolboxes, materials list, scaling, zoom, layers, & support of 7 file formats. DOS version also available $162

Thousands of Titles In-Stock!

SONY

NEW

W/ Energy Saving Auto Off
- 15" Flat Square Tube
- .25mm Aperature Grille Pitch
- Max Resolution 1280x1024
- Energy Star & MPR-II
- Digital Microprocessor Controlled

Only $439

PRINTERS

CANON

BJ10SX	209*
BJ200E	259*
BJ230	358*
BJC-600 Color	539*
BJC800	1429*

CITIZEN

Notebook Printer II Color	315

DICONIX

Kodak 180si	215
Kodak Color Ease Dye Transfer	6471

EPSON

FX870 / FX1170	267/354
LQ570+ / LQ870	245/444
LQ1070 / LQ1170	365/611
DFX5000 / DFX8000	1327/2269
Stylus800	279

HEWLETT PACKARD

Deskjet 310 Portable	318
Deskjet 520	289
Deskjet 560C	589
Deskjet 1200C	1399
Laserjet 4L	674
Laserjet 4P	979
Laserjet 4 Plus	1424
Laserjet 4	1368
Laserjet 4M	1929
Laserjet 4M Plus	1979
Laserjet 4Si	2978
Laserjet 4SiMX	4389

IBM

Exacjet II 4076	279
Laser 10	1119
Laser 10R	1339
Lsr 10R Duplex / Lsr 12R	1849/1664
Laser 12L / Laser 16L	1929/2689

OKIDATA

184 Turbo	219
320 / 321	299/419
520 / 521	369/486
590+ / 591+	419/569
395 / 395c	959/1029
Laser 400E	498
Laser 810	899
OL410e	649

PANASONIC

KXP2023	179
KXP3123 / 3124	249/325
KXP2124 / KXP1824	318/385
KXP3624	415
KXP4440 / 5400 Laser	1029/819
KXP5410 Postscript Laser	1219

QMS

420 Postscript	1159
860 / 860+ Hammerhead	3469/4799
Colorscript 210	3139
Colorscript 230	6965
Colorscript 1000 Clr Lsr	9898
PS1725	4349

SEIKO

Smart Label Printer+ DOS/Win	139
Smart Label Printer Pro	228
CH-4104PSE Color Pstscrpt	2423

TEXAS INSTR

MicroMarc Color	389
MicroWriter Basic 5ppm	517
MicroWriter PS23 5ppm	677
MicroWriter PS65 5ppm	815
MicroLaser Pro PS23 8ppm 600dpi	1309
MicroLaser Pro PS65 8ppm 600dpi	1519

*W/$30 rebate (ends 9/94).

DIRECT ORDER LINE

1-800-65-WORKS

(1-800-659-6757)

Fast Shipping, no problem! We deliver when you need it.

DHL · Airborne Express · UPS

24-Hour FAX Line 1-708-459-6933
International line 1-708-459-6884
Customer Service 1-708-459-9410
Technical Support 1-708-459-9411

Circle 108 on reader service card.

Value means more computer for your money...

Great features, performance and reliability...

which is why so many PCs worldwide...

Are really Acer's underneath...

and why so many smart buyers choose Acer.

ACER COMPUTERS
THE INDUSTRY SOURCE

The Industry Source
Means Value.

Great AcerNote pricing means you can snap up a superior notebook.

Desktop Power To Go

Now you can have twice the power of a desktop system in your notebook computer. With the lightning-fast IntelDX4™ processor running at 75MHz, your productivity will reach new heights. After all, if you're busy enough to need a notebook, you sure don't have time to sit and watch the hourglass.

Modularity For Your Notebook

Convenient, upgradable architecture has arrived with the AcerNote 780cx. It features a revolutionary modular design that makes upgrading components and servicing easy. That's important, because when you're traveling with your notebook, your system administrator won't be around to help you.

Add New Features As They Are Announced

As higher capacity hard drives become available, you can plug them in yourself with the easy-to-open Acer SmartCase.™ And look forward to being able to grow into the latest and greatest features as they are announced.

PCMCIA Gives You Easy Communication

You can simply slide in a credit card-sized PCMCIA card that lets you tap into your network, send information to a fax machine via modem, access additional storage devices or plug in more memory. And once you return to the office, you can easily transfer your new data to your desktop.

Count On Dependability With The Industry Source, Acer

Many of the leading notebooks are manufactured by Acer—now you can have the confidence that comes from using the industry source.

AcerNote 780cx IntelDX4™/75MHz

- IntelDX4/75MHz processor with built-in 16KB cache and coprocessor
- 8MB system RAM
- SmartCase™ easy-to-open modular housing for easy upgrades and serviceability
- Easily upgradable 340MB 2.5" hard drive
- Easy-to-remove keyboard for quick memory and BIOS upgrade
- EasyTrac™ centrally located removable trackball
- 2 PCMCIA Type II Slots/1 Type III Slot
- 1.44MB diskette drive
- Local bus accelerated graphics
- Suspend-to-Disk feature, "No-Reboot" CMOS setup and Suspend-Resume hot button preserve battery life
- 9.5" active-matrix LCD displays 256 colors
- Simultaneous LCD/CRT display
- Slim 8.66" x 11.4" x 2.1" case weighs 6.4 lbs, including NiMH battery pack
- Graphic battery gauge indicates remaining battery life
- One year 24-hour "Hot Swap" warranty in the U.S. and Canada

intel inside

NEW

$3,995

$132 A Month Business Lease

The Industry Source means value.

Expandability For Tomorrow, Power For Today

The AcerNote 760 series gives you all the expandability of the 780cx, plus more power than many current desktop PCs. The high performance of the intel486™DX2/50MHz processor, combined with local bus architecture, gives you the power to take all your projects on the road with you, not just the less demanding ones.

intel inside

AcerNote Gives You Easy Upgrades!

You also get the same convenient, upgradable architecture in the AcerNote 760 series as in the higher-priced 780cx. A revolutionary modular design makes upgrading components and servicing easy. If you're on the road when you need more storage or memory, you can simply plug in off-the-shelf components yourself.

Suspend/Resume Hot Button Saves You Time!

The AcerNote 760 series offers time-saving benefits for the traveler, including the ability for you to jump right back into your applications from where you left off. By using a "hot button" you can close down and re-enter your work instantly, without having to wait for the usual boot-up procedure. This power-saving feature assures a 3-5 hour battery life.

Assistance Around The Globe

Because the most powerful notebook does you no good if it's not working when you need it, the AcerNote series is backed by a one-year, 24-hour replacement warranty in the U.S. and Canada. To assure you support in over 20 countries worldwide, a free one-year Acer International Travelers Warranty is also included.

WARRANTY

30-Day Money-Back Guarantee

We are so sure that you'll be totally satisfied with your new Acer system that we're offering a full 30-day money-back guarantee—no questions asked.

World class service with assistance around the globe.

AcerNote 760cx i486DX2/50MHz
The Presentation Performer

- i486DX2/50MHz Processor with Built-In 8K8 Cache
- 4MB System RAM
- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Active-Matrix LCD Displays 256 Colors
- 340MB 2.5" Hard Disk Drive
- Palmrest with Integrated Trackball
- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- MS-DOS 6.2, Microsoft Windows 3.1
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty in the U.S. and Canada

$3,495

$128 A Month Business Lease

AcerNote 735c 486SX/33MHz
The Value Winner For Presentations

- Intel SL-Enhanced 486SX/33MHz Processor
- 4MB System RAM
- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Dual-Scan LCD Color Display
- 209MB 2.5" Hard Disk Drive
- Palmrest with Integrated Trackball
- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- MS-DOS 6.2, Microsoft Windows 3.1
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty in U.S. and Canada

$1,995

$73 A Month Business Lease

PCMCIA Fax/Data Modems And LAN Cards

Your office at your fingertips! A removable PCMCIA card allows you to send and receive faxes and data at a rate of up to 14.4 baud, with fax software for simple, error-free operation. LAN cards, with your option of either twisted-pair or coaxial cable, get you into your office network with ease.

Spare Battery

NiMH Battery Pack $169

NiCad Battery Pack $99

Additional Memory

AcerNote Series—4MB Memory Upgrade **$269**

AcerNote Series—8MB Memory Upgrade **$699**

AcerNote 760c i486DX2/50MHz

- i486DX2/50MHz processor with built-in 8K8 cache
- 4MB system RAM
- SmartCase easy-to-open modular housing for upgradability and serviceability
- Easily upgradable 340MB 2.5" hard drive
- Easy-to-remove keyboard for quick memory and BIOS upgrade
- EasyTrac centrally located removable trackball
- 2 PCMCIA Type II Slots/ 1 Type III Slot
- 1.44MB diskette drive
- Local bus accelerated graphics
- Suspend-to-Disk feature, "No-Reboot" CMOS setup and Suspend-Resume hot button preserve battery life
- 9.5" dual-scan LCD
- Simultaneous LCD/CRT display
- Slim 8.66" x 11.4" x 1.8" case weighs 6.4 lbs, including NiMH
- Graphic battery gauge indicates remaining battery life
- One year 24-hour "Hot Swap" warranty in the U.S. and Canada

NEW

$2,495

$92 A Month Business Lease

AMERICAN EXPRESS Cards Welcome · VISA · MasterCard · LEASING

Call 800-230-ACER

When calling, please reference #094 ACD

Monday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time

Acer®

New lower AcerPower prices mean you can step up to a better desktop.

With Acer you can't buy more value.

intel inside pentium processor

Acer Brings 90MHz Pentium™ Processor Systems To Market

The 90MHz Pentium chip is the most powerful PC processor selling today. It runs PC software faster than any other processor available. With such dramatic advancements in technology, time to market really matters. As the industry source, Acer can incorporate changes into its product line more quickly than other companies. When you need the latest and greatest hardware, talk to Acer.

Power Of The Pentium

The Pentium processor is fully compatible with the entire range of i486™ and i386™ processors, allowing backward-compatibility with the legion of 486 hardware in use. It has data integrity features for mission-critical applications, and includes multiprocessor capabilities needed by advanced servers and high-performance desktops and workstations. The Pentium processor family utilizes advanced design techniques to speed up today's graphics applications and enable tomorrow's emerging applications, such as full-motion video and computer-aided design.

Join The Revolution With The AcerPower 90MHz Pentium Processor System

The AcerPower™ Pentium workstation represents the next technological leap forward by combining unparalleled 90MHz Pentium-based processing with the high-speed PCI local bus, for the ultimate in power and speed. The fast throughput of this system gives you the high-performance needed for the future with true-color, full-motion video and 3-D graphics. And PCI also allows automatic configuration of new peripherals as you install them into your system.

- Intel® Pentium/90MHz Processor
- 8MB System RAM (Expandable to 128MB)
- 256KB Second-Level Cache
- 540MB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- Panasonic® 2X CD-ROM Drive
- 15" .28mm Non-Interlaced Flat Screen Digital SVGA Color Monitor
- 1MB 64-Bit PCI Graphics Accelerator Card
- 1.44MB Diskette Drive
- 2 PCI Expansion Slots
- 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Slot
- Microsoft® Windows™ for Workgroups, MS-DOS® 6.2, Productivity/Entertainment Packs, Works for Windows,™ and Quicken™ Installed

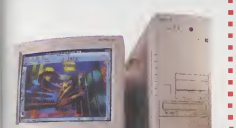
NEW LOW 90MHz PRICE

$2,595

$90.A Month Business Lease

The Industry Source means value.

AcerPower Pentium/60MHz



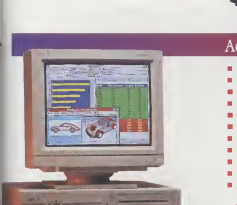
- Intel Pentium/60MHz Processor
- 8MB System RAM (Expandable to 192MB)
- 256KB Second-Level Cache
- 420MB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 14" .28mm Non-Interlaced Flat Screen SVGA Color Monitor
- 1MB 64-Bit PCI Graphics Accelerator Card
- 2 PCI 64-Bit Expansion Slots
- 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Expansion Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed

PC WORLD

$2,195
$81 A Month Business Lease

PC World Best Buy

AcerPower 486DX2/66MHz



- Intel 486DX2/66MHz Processor
- 4MB System RAM (Expandable to 64MB)
- 128KB Second-Level Cache
- 340MB IDE Fast Hard Disk Drive
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 14" .28mm Non-Interlaced Flat Screen SVGA Color Monitor
- 1MB 64-Bit PCI Graphics Accelerator Card
- 2 PCI 64-Bit Expansion Slots, 3 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Expansion Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed

$1,795
$66 A Month Business Lease

The New Value Leader

AcerPower Pentium/90MHz

- Intel Pentium/90MHz Processor
- 16MB System RAM (Expandable to 128MB)
- 256KB Second-Level Cache
- 540MB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 2MB 64-Bit PCI Graphics Accelerator Card
- 17" .28mm Non-Interlaced Digital SVGA Color Monitor
- 2 PCI Expansion Slots, 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Expansion Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed

$3,395
$124 A Month Business Lease

AcerPower Pentium/90MHz

- Intel Pentium/90MHz Processor
- 16MB System RAM (Expandable to 128MB)
- 256KB Second-Level Cache
- 540MB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 2MB 64-Bit PCI Graphics Accelerator Card
- 15" .28mm Non-Interlaced Flat Screen Digital SVGA Color Monitor
- 2 PCI Expansion Slots, 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Expansion Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed

$2,995
$110 A Month Business Lease

AcerPower 486DX2/50MHz

- Intel 486DX2/50MHz Processor
- 4MB System RAM (Expandable to 64MB)
- 128KB Second-Level Cache
- 340MB IDE Fast Hard Disk Drive
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 14" .28mm Non-Interlaced Flat Screen Digital SVGA Color Monitor
- 1MB VESA Graphics Accelerator Card
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed

$1,595
$110 A Month Business Lease

AcerAcros 486SX/33MHz

- Intel 486SX/33MHz Processor
- 4MB System RAM (Expandable to 64MB)
- 340MB IDE Fast Hard Disk Drive
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 1MB VESA Graphics Accelerator Card
- 14" .28mm Non-Interlaced Flat Screen SVGA Color Monitor
- 4 ISA 16-Bit Expansion Slots
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken Installed
  - 128KB Cache Upgrade.....$30

$1,395
$51 A Month Business Lease

Rely On The Strength Of A $1.9 Billion Giant

Since our start in 1976, Acer has grown to be the vendor of choice for the world's top computer companies.

Multimedia Upgrade Kit

Make the most of the new Acer CD-ROM standard with this special multimedia upgrade kit that includes: Sound Blaster and Business Audio-compatible 16-bit sound card; high-performance stereo speakers; Microsoft multimedia bundle with Works, Encarta,™ Golf, Cinemania™ and SoundBits.™

Only $150
Available with system purchase only.

Features	Acer	Dell
Manufacturer of most system component parts	YES	
2-1 Hour Notebook Replacement Warranty	YES	
International Travelers Warranty	YES	
CD ROM in every System	YES	
Free On Site Service With Every Desktop System	YES	yes
19 years in the PC Business	YES	
ISO 9002 quality certified	YES	
24-Hr. Toll Free Tech Support	YES	yes

A Full Year Of On-Site Service

Don't worry. If you have a problem with your Acer desktop system, we'll have a skilled service representative out to you in 48 hours—we promise.

Please call 1-800-233-ACER for details on the money-back guarantee, limited warranty and International Travelers Warranty. Return shipping and insurance charges are the responsibility of the customer. Not available in Canada. On-site service may not be available in certain remote locations. Products, availability, prices and programs are subject to change or cancellation without notice. Shipping and handling charges are extra. Acer, AcerAcros and the Acer logo are registered trademarks and AcerRacks, AcerPower, AcerView, ChipUp and SmartCase are trademarks of Acer America Corporation and Acer, Inc. Intel and the Intel Inside Logo are registered trademarks and Pentium and the Pentium Processor logo are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1994 Acer America Corporation. All rights reserved.

AMERICAN EXPRESS Cards Welcome · VISA · MasterCard · LEASING

Call 800-230-ACER

When calling, please reference #094 ACD

Monday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time

Acer

Arlington Computer Products... Great Prices and Service Since 1984!

- PC Magazine: *"—Arlington offers worry-free mail order purchasing!"*
- PC Computing: *"Courteous service and terrific technical support!"*
- PC Computing Review: *"5 Star Pricing!"*

10 Year Anniversary!

HEWLETT-PACKARD

Laserjet IV/IV+ .... $1299/$1439
Laserjet IVP w/Toner $959
Laserjet IV L w/Toner $669
Laserjet IV SI w/Toner .. $2989
Laserjet IVM+/MP .$1949/$1379
2MG/4MG ..... $99/$159
8MG Upgrade $319
Deskjet 550C $429
Deskjet 520/560 ..... $289/$569
Deskjet 1200C $1439
Deskjet 1200C P/S $2099
IIC Scanner $949

OKIDATA

ML320 .. $295 ML395 .. $949
ML321 .. $415 3410 ... $1199
ML380 .. $205 OL400E .$495
ML520 .. $365 OL410E. $645
ML521 .. $489 OL810 .. $899
ML590 .. $409 OL830 . $1089
ML591 .. $559 OL850 . $1189
Okilaser 2MG $129
Doclt 3000 ..... $1799
Doclt 4000 ..... $2129

Canon

BJ-10SX $209*
BJ-100 ..... $249*
BJ-200E $255*
BJ-230 ..... $359*
BJC-600 ..... $529*
LBP-430 ..... $549*
LBP-860 ..... $1069*
*After Rebate
**Dual Color - $1799

CANON 486-SL/25 Mhz - $1199**

• 120 MG • Fax Modem

EPSON PRINTERS

FX870 ..... $259 LQ870 .... $425 LQ2550 ... $879 Stylus 800 ... $269 Action 3250 .. $169
FX1170 .... $345 LQ1070+ .. $355 DFX5000 . $1299 Stylus 1000 .. $429 Action 1500 .. $639
LQ570+ ... $235 LQ1170 ... $589 DFX8000 . $2189 Stylus Color . $549 Action 1600 .. $929

Thousands of Printers in Stock!!! — Most shipped same day!!!

Panasonic

Office Automation

2023 .... $179 4400 .... $449
2130 .... $199 4410 .... $449
2124 .... $295 4430 .... $639
2624 .... $389 4440 .... $989
3123 .... $269 5400 .... $779
4410/4450I 2 MG ...$125

NOTEBOOKS

Canon 486-120 MG $1199
Canon 486-120 MG-Color $1889
Canon Notejet 200 .... $1929
Notejet 200 MG-Color . $2499
Notejet II-50/260 MG .. $2949
TM486/DX 2/50E Color $2829
TM4000E DX 4-75 ..... $3549

NETWORKING

Netware 3.12 5 User $569
Netware 3.12 10 User .. $1289
Netware 3.12 25 User .. $1849
Netware 3.12 50 User .. $2349
Netware 3.12 100 User . $3349
Netware 4.0 10 User $1599
Lantastic Starter 5.0 .... $409
2000C Noderunner $159
NE2000/5-Pack ..... $69/$329
SMC Hub T/P 12 ..... $509
Ethercard +/+16 .... $89/$115
3 Com EtherLink III $109
3 Com EtherLink 5-Pack $469
Intel Ether 16 ..... $89
Intel Ether 16-5 Pack ... $429
Intel Ether 16-20 Pack . $1579
Intel Flash/5-Pack .. $99/$475
Intel Token 16/4 ..... $339
Intel Netport EL $355
Xircom Pocket Ethernet $249

SCAN. & DIGIT.

Epson Action Scanning . $749
Epson Scanning Prof. . $1189
Scanman 256 Omni Page$185
Summasketch 12×12 .... $255
Summasketch 12×18 .... $499

SHARP.

JX9400 ..... $449
JX9460PS $895
PC8650 ..... $2599
PC8650 II $2749

MONITORS

NEC

2V/3V ..... $329/$459
3 FGE/4 FGE ..... $539/$589
5 FGP $1079
5 FGE $969
6 FGP $1949

MAG

DX/MX 15F 15" ... $345/$459
DX/MX 17F 17" ... $659/$779

NANAO

F340IW/F560IW .. $649/$1229
F550I/F550IW ..... $899/$979
T560I/F760IW ... $1459/$1979

VIEWSONIC

15/17G ..... $429/$769
17 ..... $679
20/21 ..... $1499/$1679

VIDEO BOARDS

ATI Graph Ultra + 2MG . $189
ATI Graph Prof 2 MG ... $259
ATI Graph Terbo $359
Diamond Viper 2 MG ... $329

CHIPS

1MB/4 MB Simms .. $49/$149
Cyrix DRx2-20/40 ..... $229
Cyrix DRx2 25/50 ..... $265
Cyrix DRx2 33/66 ..... $319
Epson Action 2 MG $139
Intel 80387 SX/DX ... $75/$85

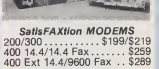
intel. — OVERDRIVE

Sx2-50 Dble 20-25 Mhz . $189
Dx2-50 Dble 20-25 Mhz . $259
Dx2-66 Dble 33 Mhz $289

MODEMS

intel.

Int. 14.4/14.4 Fax $115
Ext. 14.4/14.4 Fax $135
PCMCIA 24/96 ..... $129
PCMCIA 14.4/14.4 ..... $195



SatisFAXtion MODEMS

200/300 ..... $199/$219
400 14.4/14.4 Fax $289
400 Ext 14.4/9600 Fax .. $289

Hayes

Accura 14.4/Int/Ext. $119/139
Accura 28.8 Ext $255
Optima 96/14.4 .... $309/$339
Optima 28.8 Ext. $399
Pocket 14.4 ..... $289
PCMCIA 14.4 ..... $289

PRACTICAL PERIPHERALS.

14.4 Fax Int/Ext ... $105/$119
14.4 Pocket $269
28.8 Int/Ext ..... $219/$229
PCMCIA 14.4 ..... $265

U.S. Robotics

Terbo Dual Std. Fax $679
14.4 Int/Ext. ..... $109/$125
Sportster 14.4 Int. Fax .. $119
Sportster 14.4 Ext. Fax . $135
Courier Terbo Int. Fax . $335
World PortPCMCIA 14.4 $195

GVC

14.4 w/Fax Int/Ext ... $85/$95
28.8 Int/Ext ..... $185/$195

SOFTWARE

Aldus Pagemaker 5.0 ... $499
Corel Draw 4.0 ..... $359
D Base IV $379
Harvard Graphics $299
Lotus 123 2.4/3.1 .. $279/$325
Microsoft Windows 3.1 .. $79
Microsoft Office $449
Microsoft Off Pro $519
Microsoft DOS 6.2 ..... $69
Q & A 4.0 ..... $179
Word Perfect 6.0 ..... $249
Word Perfect Windows . $269

DRIVES & TAPES

Dual Floppy $99
3½" 1.44 ..... $39
Connor 250 ..... $139
Connor Parallel 250 .... $289

COLORADO

Colorado Jumbo 120 .... $99
Colorado Jumbo 250 .... $149
Colorado Trakker 250 . $299
Qik 80 Formatted Tape .. $19
Power Tape 2400 1.2 Int. $939

AMERICAN UPS

250 ..... $99 600 ..... $259
400 ..... $155 900 ..... $359
450 ..... $185 1250 .... $485

CD ROM OPTICAL DISKS

Chinon 535 Int/Ext $299/$389
Sound Blast 16 SCSI 2 . $169
Texel 3028 Int/Ext . $289/$329
Mitsumi Int DS $149

Triple Speed!!!

NEC 3Xi $409
NEC 3Xe $439
NEC 3Xp/4X Pro .. $369/$869

SEAGATE HARD DISKS

260 MG 3290A $225
341 MG 3391A $239
452 MG 3550A $329
535 SCSI 3655N $519
542 MG IDE 3655A $389

Arlington Computer Products, Inc.

Prices and availability subject to change without notice. Purchase orders accepted from Qualified Customers. No surcharge for Charge Cards!

HOURS C.S.T.
7:30 - 8:30 pm Mon.-Fri.
9:30 - 5:00 pm Saturday

1970 CARBOY
MT. PROSPECT, IL 60056

FOR ORDERS & QUOTES: **800-548-5105**
CUSTOMER SERVICE AND IN ILLINOIS 708-228-6333
SHIPPING 708-228-9748
TECHNICAL ASSISTANCE 708-228-1470
We Export! FAX 708-228-0516

Circle 160 on reader service card

ICS gives you the fastest, most powerful computer available from any comparable home-study course!

Get into a money-making career in personal computer repair

The U.S. Dept. of Labor states that many highly-qualified computer repair technicians are earning over $30,000 a year. And the PC repair field is targeted for higher-than-average growth throughout this decade and beyond!

DOS 6
Comes with DOS installed!

Comprehensive PC Repair Video
Takes you step by step through all of the most common PC malfunctions and how to repair them

PC Tool Kit Includes screwdrivers, chip inserter/extractor, torx screwdrivers, nut drivers, insulated tweezers and more.

Professional Diagnostic Card and Diagnostic Software
Enables you to locate and repair almost any computer problem.

Digital Volt-Ohm Milliammeter
Provides voltage, current and resistance measurements, and checks for circuit malfunctions.

Train at home in your spare time to enter one of the fastest-growing, highest-paying computer careers!

When it comes to PC Repair training at home, the choice is overwhelmingly clear...ICS is #1!

Here are just a few advantages ICS gives you that the competition doesn't...

NEW! FASTER! 486DLC computer

Why settle for a 486SX when ICS gives you a superior, faster 486DLC for less money...

Only ICS gives you:

- Cyrix's 486DLC/33MHz CPU greatly outdistances Intel's 486SX/25 in benchmark testing
- Cyrix's 33 megahertz 486DLC microprocessor
- IBM-compatible 486DLC with true 32-bit architecture
- 1Kb internal cache plus a high-speed 64Kb external cache
- 2400 baud internal modem
- access to ICS Online with numerous exciting services to choose from
- 256+ color capacity Super VGA high-resolution monitor
- 1.44MB 3.5" floppy disk drive

Plus you also receive...

- Ready to use 80MB IDE hard disk drive
- 1MB RAM expandable to 32MB
- ISA expansion slots
- 101-key enhanced keyboard

ICS is the largest, most recognized at-home training institution in the world...

...ied over 10 million
...for new careers.
...is used by over 2,000
...ons such as IBM,
...ont, and Avon.
...u easy low monthly
...with 0% financing.
...you the renowned ICS
...d around the world.

...itional
...ncil
...C.,
...ed.

ACCREDITED BY THE NATIONAL ASSOCIATION OF TRADE AND TECHNICAL SCHOOLS

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1273 SCRANTON, PA

POSTAGE WILL BE PAID BY ADDRESSEE

INTERNATIONAL CORRESPONDENCE SCHOOLS
925 OAK STREET
SCRANTON PA 18540-9888

...Computer Training,
...925 Oak Street, Scranton, PA 18515

...e free facts that tell how I
...n PC repair. I understand
...I no salesman will visit me.

Age _____
Apt. # _____
Zip _____

Arlington Computer Products . . . Great Prices and Service Since 1984!

- PC Magazine: *"—Arlington offers worry-free mail order purchasing!"*
- PC Computing: *"Courteous service and terrific technical support!"*
- PC Computing Review: *"5 Star Pricing!"*

10 Year Anniversary!

HEWLETT-PACKARD

Laserjet IV/IV+ . . . . $1299/$1439
Laserjet IVP w/Toner $959
Laserjet IV L w/Toner $669
Laserjet IV Si w/Toner . . $2989
Laserjet IVM+/MP . $1949/$1379
2MG/4MG . . . . . $99/$159
8MG Upgrade $319
Deskjet 550C $429
Deskjet 520/560 . . . . . $289/$569
Deskjet 1200C $1439
Deskjet 1200C P/S $2099
IIC Scanner $949

OKIDATA

ML320 . . $295 ML395 . . $949
ML321 . . $415 3410 . . . $1199
ML380 . . $205 OL400E. $495
ML520 . . $365 OL410E. $645
ML521 . . $489 OL810 . . $899
ML590 . . $409 OL830 . . $1089
ML591 . . $559 OL850 . . $1889
Okilaser 2MG $129
Docit 3000 . . . . . $1799
Docit 4000 . . . . . $2129

Canon

BJ-10SX $209*
BJ-100 . . . . . $249*
BJ-200E $255*
BJ-230 . . . . . $359*
BJC-600 . . . . . $529*
LBP-430 . . . . . $549*
LBP-860 . . . . . $1069*

*After Rebate
**Dual Color - $1799

CANON 486-SL/25 Mhz - $1199**

• 120 MG • Fax Modem

EPSON PRINTERS

FX870 . . . . $259
FX1170 . . . . . $345
LQ570+ . . . $235
LQ870 . . . . $425
LQ1070+ . . $355
LQ1170 . . . $589
LQ2550 . . . $879
DFX5000 . $1299
DFX8000 . $2189
Stylus 800 . . . $269
Stylus 1000 . . $429
Stylus Color . $549
Action 3250 . . $169
Action 1500 . . $639
Action 1600 . . $929

Thousands of Printers in Stock!!! — Most shipped same day!!!

Panasonic

Office Automation

2023 . . . . $179 4400 . . . . $449
2130 . . . . $199 4410 . . . . $449
2124 . . . . $295 4430 . . . . $639
2624 . . . . $389 4440 . . . . $989
3123 . . . . $269 5400 . . . . $779
4410/4450i 2 MG $125

NOTEBOOKS

Canon 486-120 MG $1199
Canon 486-120 MG-Color $1889
Canon Notejet 200 . . . . $1929
Notejet 200 MG-Color . $2499
Notejet II-50/80 MG . . . $2949
TM486/DX 2/50E Color $2829
TM4000E DX 4-75 . . . . . $3549

NETWORKING

Netware 3.12 5 User $569
Netware 3.12 10 User $1399
Netware 3.12 25 User
Netware 3.12 50 User
Netware 3.12 100 Use
Netware 4.0 10 User .
Lantastic Starter 5.0 .
2000C Noderunner . .
NE2000/5-Pack . . . . . $
SMC Hub 7/P 12 . . . .
Ethercard +/+16 . . . . $
3 Com EtherLink III . .
3 Com EtherLink 5-Pa
Intel Ether 16 . . . . . .
Intel Ether 16-5 Pack
Intel Ether 16-20 Pack
Intel Flash/5-Pack . . $
Intel Token 16/4 . . . . .
Intel Netport EL . . . .
Xircom Pocket Ether

SCAN. & DI

Epson Action Scanni
Epson Scanning Prof
Scanman 256 Omni F
Summasketch 12×12
Summasketch 12×18

SHARP

JX9400 . . . . . $449
JX9460PS $895
PC8650 . . . . . $2599
PC8650 II $2749

MONITORS

NEC

2V/3V . . . . . $329/$459
3 FGE/4 FGE . . . . . $539/$589
5 FGP $1079
5 FGE $969
6 FGP $1949

MAG

DX/MX 15F 16" . . . . $345/$459
DX/MX 17F 17" . . . . $659/$779

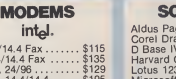
NANAO

F340IW/F560IW . . $649/$1229

MODEMS

intel.

Int. 14.4/14.4 Fax $115
Ext. 14.4/14.4 Fax $135
PCMCIA 24/96 . . . . . $129
PCMCIA 14.4/14.4 . . . . . $195



SatisFAXtion MODEMS

200/300 . . . . . $199/$219
400 14.4/14.4 Fax $259
400 Ext 14.4/9600 Fax . . $289

Hayes

SOFTWARE

Aldus Pagemaker 5.0 . . . $499
Corel Draw 4.0 . . . . . $359
D Base IV $379
Harvard Graphics $299
Lotus 123 2.4/3.1 . . $279/$325
Microsoft Windows 3.1 . . . $79
Microsoft Office $449
Microsoft Off Pro $519
Microsoft DOS 6.2 . . . . . $69
Q & A 4.0 . . . . . $179
Word Perfect 6.0 . . . . . $249
Word Perfect Windows . $269

DRIVES & TAPES

Dual Floppy $99
3½" 1.44 . . . . . $39
Connor 250 . . . . . $139
Connor Parallel 250 . . . . $289

COLORADO

ICS

SINCE 1890

YES! Send me the FREE information package for the one course I've checked that explains how ICS can train me for a successful new career. ***CHECK ONE BOX ONLY.***

☐ **PC REPAIR**

Other Computer Careers:

☐ Computer Programming/BASIC
☐ Computer Programming/COBOL
☐ Small Business Management
☐ ASB Degree in Applied Computer Science
☐ Computer-Assisted Bookkeeping
☐ PC Specialist
☐ Desktop Publishing & Design

Career Diploma Courses:

☐ Electrician
☐ Medical Office Assistant
☐ High School
☐ Paralegal
☐ TV/VCR Repair
☐ Professional Locksmithing
☐ Appliance Repair

ASB and AST Degree Programs:

☐ Business Management
☐ Accounting
☐ Mechanical Engineering Technology
☐ Electrical Engineering Technology

CALL TOLL FREE 1-800-596-5505 Ext. 5147

CALL ANYTIME—*24 hours a day, 7 days a week*

OR MAIL THIS CARD TODAY!

Name _____ Age _____
Address _____ Apt. # _____
City/State _____ Zip _____
Phone ( ) _____

DEPT. PCN5945 PC Computing 17VF

Arlington Computer Products

ICS gives you the fastest, most powerful computer available from any comparable home-study course!

Get into a money-making career in personal computer repair

The U.S. Dept. of Labor states that many highly-qualified computer repair technicians are earning over $30,000 a year. And the PC repair field is targeted for higher-than-average growth throughout this decade and beyond!

DOS 6
Comes with DOS installed!

Comprehensive PC Repair Video
Takes you step by step through all of the most common PC malfunctions and how to repair them

PC Tool Kit Includes screwdrivers, chip inserter/extractor, torx screwdriver/nut drivers, insulated pliers and more

Professional Diagnostic Card and Diagnostic Software
Enables you to locate and repair almost any computer problem.

Digital Volt-Ohm Milliammeter
Provides voltage, current and resistance measurements, and checks for circuit malfunctions.

When it comes to PC Repair training at home, the choice is overwhelmingly clear...ICS is #1!

Here are just a few advantages ICS gives you that the competition doesn't...

Why settle for a 486SX when ICS gives you a superior, faster 486DLC for less money...

Only ICS gives you:

- Cyrix's 486DLC/33MHz CPU greatly outdistances Intel's 486SX/25 in benchmark testing
- Cyrix's 33 megahertz 486DLC microprocessor.
- IBM-compatible 486DLC with true 32-bit architecture
- 1Kb internal cache plus a high-speed 64Kb external cache
- 2400 baud internal modem
- access to ICS Online with numerous exciting services to choose from
- 256+ color capacity Super VGA high-resolution monitor
- 1.44MB 3.5" floppy disk drive

Plus you also receive...

- Ready to use 80MB IDE hard disk drive
- 1MB RAM expandable to 32MB
- ISA expansion slots
- 101-key enhanced keyboard

ICS is the largest, most recognized at-home training institution in the world...

- Only ICS has trained over 10 million men and women for new careers.
- Only ICS training is used by over 2,000 leading corporations such as IBM, Xerox, Ford, Dupont, and Avon.
- Only ICS gives you easy low monthly payment options with 0% financing.
- Only ICS awards you the renowned ICS Diploma respected around the world.
- As a longstanding member of the National Home Study Council in Washington, D.C., our courses are nationally accredited.

ACCREDITED MEMBER OF THE NATIONAL HOME STUDY COUNCIL

Train at home in your spare time to enter one of the fastest-growing, highest-paying computer careers!

Only ICS, the world's leader in training at home, gives you hands-on practice with a high-performance 486DLC IBM-compatible computer with Cyrix microprocessor, color monitor and internal modem, as you master the latest techniques and innovations in PC servicing and repair. You get the same high-quality training taught at vocational and trade schools but without spending years attending classes. You can complete your training in just months...you'll even be able to start making money doing repair jobs before you finish your course.

Our computer specialists have spared no effort in ensuring that this is the finest PC repair course available through home study.

Compare ICS training—you get better equipment/lower tuition!
Don't be confused by other schools that try to duplicate ICS training. Check the facts by sending for our free information package.

You receive a fully assembled 486DLC IBM-compatible personal computer system!
This high-performance system is all you'll need to learn PC servicing and repair. Step by step you're taught how to troubleshoot, repair/replace all of the major components of this amazing system.

ICS hands-on training is the key to your successful future in PC repair!
You receive practical, real-world computer servicing experience on your 486DLC computer, using the professional tools and diagnostic hardware and software that's included with your course—everything is explained step by step.

Learn to service and repair every type of personal computer!
ICS makes you competent with the latest technology so you'll be able to handle any computer servicing job that comes your way. You'll learn how to set up and configure PC systems...how to replace central processing unit (CPU) components, hard drives, floppy drives, keyboards, monitors and printers...how to detect and deal with computer viruses...how to upgrade PCs and much more.

Your career in PC repair begins with the big, full-color FREE information package we send you when you mail the post-paid card at left.
Get the facts you need on our revolutionary PC repair course. Send for free information that tells how ICS training can start you toward a high-paying career as a PC Service Technician.

Mail the postage-paid card at left today. If card is missing, mail coupon at right.

OR CALL TOLL FREE:
1-800-596-5505 Ext. 5147
CALL ANYTIME— 24 hours a day, 7 days a week.

ICS SINCE 1890 **School of Computer Training,** **Dept. PCN5945,** 925 Oak Street, Scranton, PA 18515

YES! Please send me free facts that tell how I can train at home to learn PC repair. I understand there is no obligation and no salesman will visit me.

Name _____ Age _____
Address _____ Apt # _____
City/State _____ Zip _____
Phone ( ) _____

5945C

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

WE ACCEPT PO'S FROM QUALIFIED FIRMS

M E M O R Y

NO SURCHARGE FOR MC, VISA AE & DISCOVER

CACHE MEMORY

	12NS	15NS	20NS	25NS
8Kx8	–	6 50	6 00	5 50
32Kx8	19 00	9 00	8 00	7 00
64Kx1	–	11 00	9 00	8.00
64Kx4	–	11 00	9 00	8.00
16Kx4	–	8 00	7 00	6 00
128Kx8	–	–	39 00	29 00

Individual D-RAM Chips

MEMORY FOR IBM & APPLE

	50NS	50NS	70NS	80NS	100NS
1Megx1		6 85	6 45	5 95	4 95
1Megx4	-	56 00	55 00	54 00	–
1Megx4 (Zip Pk)	–	24 00	22 00	21 00	–
256x4(Page Dip)	–	7 25	6 75	6 50	5 95
256x4(Static Dip)	–	–	9 95	–	–
256x4(Page Zip)	–	9 25	9 00	8 95	–
256x4(Video Zip)	–	–	12 95	11 95	9 95
256 x1	–	3 25	2 95	2 75	2 25
64x4	–	–	–	3 75	–
64x1	–	–	–	–	2.00
256x16 SOJ	–	–	–	–	–
256x16 Video Zip	–	–	CALL	–	–

Dual write enable Pac Bell

INTEL Math Chips

8087	39 00
8087-2	45 00
8087-1	79 00
80287-XL	49 00
80387-16 DX	39 00
80387-20 DX	44 00
80387-DX (Does All)	74 00
80487-SX (Does All)	299 00
Intel SX (Does All)	69 00
Intel SL Mobil	69 00
Intel 16SX	39 00
Intel 20SX	49 00

Call for overdrive chips

AMBRA

Ambra Pentium-60	4/8/16 Meg	175 00/339 00/699 00
Ambra NC 425SL	2/4/8 Meg	109.00/209 00/449 00
Ambra N Series	4/8/12/16 Meg	189 00/379 00/569 00/829 00
Ambra SN Series	4/16 Meg	189 00/829 00
Ambra Sprinta SLC II	2/8 Meg	Call/Call

CYRIX DRx² 386 to 486 Upgrade
Clock Doubler

- Single chip upgrade solution
- Clock doubling technology
- Compatible with Industry standard 386DX CPU socket
- Compatible with DOS, Windows, 3:X, OS/2 1.3 and 2.x
- Uses Industry standard math chip
- Easy to install—about 15 minutes

The Cyrix upgrade runs at twice the speed of your original 386 microprocessor combined with a 1K on-chip cache you will enjoy a performance boost of 100% and more. Ideal for any DOS, Windows or OS/2 application which requires a large amount of microprocessor horsepower.

CX486 DRx²-16/32	260 00
CX486 DRx²-20/40	279.00
CX486 DRx²-25/50	319 00
CX486 DRx²-33/66	350 00
CX486 SRX2 16/32	240 00
CX486 SRX2 20/40	249 00
CX486 SRX2 25/50	270 00

SIMM MODULES (Add $5.00 for SIPP)

	40NS	50NS	60NS	70NS	80NS	100NS
1Meg x 9 (3 chip)	–	49 00	44 00	43 00	41 50	–
1Meg x 9 (9 chip)	–	–	46.00	45 00	43 00	39 00
4Meg x 9	–	–	162 00	158 00	149.00	–
16Meg x 9 (9 chip)	–	–	–	679 00	–	–

72 PIN SIMMS (EISA)

256 x 36	–	–	–	–	59 00	–
512 x 36	–	–	–	96 00	94 00	–
1 meg x 36	–	–	184 00	174 00	174 00	–
2 x 36	–	–	359 00	339 00	339 00	–
4 x 36 (9 chip)	–	–	689 00	669 00	669 00	–
8 x 36	–	–	1459 00	1419 00	–	–
16 x 36	–	–	2606 00	2745 00	–	–
1 x 32	–	–	174 00	184 00	–	–
2 x 32	–	–	339 00	319 00	–	–
4 x 32	–	–	649 00	629 00	–	–

CYRIX FASMATH PROCESSOR

Programs executed up to 3X faster • Plug & object code compat w/intel
83087-40MHz – 79.00 83D87-33MHz – 59.00 83S87-25SX Ver – 89.00
83S87-33SX – 79.00 PC Week™ rated #1 over all math chips
5 Year Warranty • "All Downward Compatible"

AST MEMORY

MODEL	AMT UPDRADED	AST PART #		PRICE
Bravo LC 4/25S, 4/33, 433S 4/50d 4/66d	4Meg	500987-002	72 pin	165 00
	8Meg	500987-003		330 00
	16Meg	500887-004		619 00
	32Meg	500887-005		1399 00
Premium 486/25 25E, 33, 33E Premium 386/33TE, 486/25TE, 33TE Prem Serv Prem II 386SX/20, 25 Prem II 386/25 386/33 486/33 486SX/20	8Meg	500780-001	64 pin	368 00
Premium 386/33T Prem 386SX/16 Prem II 386SX/20 25		500780-004		189 00
Premium 386/25 33 386/33T 386SX/16, Prem II 386SX20 25		500780-003		58 00
		500780-001		59 00
Premia 4/33S 4/33 4/500, 4/660	8Meg	501159-002		379 00
Premia	16Meg	501159-003		769 00
Premia	32Meg	501159-004		1469 00
Premia	64Meg	501159-005		3111 00
AST Cupid Bd	0–32Meg	500818-001		176 00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3600ME	59 00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	180 00
Z386SX	2Meg	Z-605-1 modules	119.00

MAGNAVOX

286/386SX-16, 386SX-20, 486SX-20 & 386-33 *all are 72PIN SIMM*
1MEG – 59 00 4MEG – 180 00 8MEG – 349 00 16MEG – 659 00

MEMORY BOARDS
IBM Compatibles & PS/2

BOCA AT PLUS

USES SIMMS

16 BIT MEMORY BD. FOR 286, 386 AT • 0K-8Meg Bd 4 0 LIM Compat • New 5 Yr Warr Convent, Expnd & Extnd Memory • Supports DOS, OS/2, LIM/EMS & EEMS • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Desqview, Multitask operations • ***Bd. made by Boca Research, AT plus***
0K – $04.00 2Meg – $150.00 4Meg – $239.00 0Meg – $300 00

BOCA XT 8 BIT BUS

• Expanded memory for XT • Lim 4 0 compat 0-2Meg • Uses 256x1-100
0-K – **$00.00** 1Meg **$180.00** 2Meg – **$220 00**

IBM P/S2 32BIT EXPANSION BD.

0-16Meg, Ext -Expnd Memory Bd for P/S2 70, 80, 00, Lim 4 0

0Meg	2Meg	4Meg	8Meg	16Meg
$138.00	**$238.00**	**$319.00**	**$490.00**	**$050.00**

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 80 55SX, 65SX, 16 Bit, 4 0 LIM Compat
0K – **110.00** 2Meg – **100 00** 4Meg – **283.00** 8Meg – **449.00**

USES 1 X 9 SIMMS BOCA BR MC-80

CHANGE YOUR 286 TO A 486

• Features IBM® 486 SLC2 Processor Clock Doubling (25/50 or 33/66) 16K of Internal Cache
• Simply Replaces existing 286 Processor

286 (CPU)	PLCC (Type)	25/50 MHz	279 00
286 (CPU)	PGA (Type)	25/50 MHz	279 00

IBM PS/1, PS/2 MEMORY MODULES

IBM PART NO	WORKS WITH MODEL NO	PRICE
30F5348 (512K)	30 286	37 00
30F5360 (2Meg)	30-286, 25-286, 50 MTHR BD	104 00
32G372 (16Meg ecc)	9595 OPT	
6450375 (1Meg)	80-041	79 00
6450379 (2Meg)	80 111 311-121, 321, 081 181	84 00
6451060 (4Meg)	80-A21 A-61 80-A31, 80-111, 80-311	189 00
6450604 (2Meg)	70-061 E61, 121 50Z, 55SX 65SX P-70 55LS 65LS, X-Station 120 & 130, 35SX 35LS, 40SX	89 00
6450608 (2Meg)	70-A21 A-61 B-21, B-61, 35SX, 35LS, 40SX, Val Pt 325T	90.00
78X8955 (128K)	25	35 00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	175 00
87F9977 (4Meg)	55SX 55LS, 65SX 40SX, 35SX, 35LS	175 00
1057035 (512K)	P/S1-286	49 00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	109 00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	189 00
92G7200 (4Meg)	PSII Expert Consultant Willow	184 00
92G7201 73G3131 (4Meg)	Value Point Performance, PC Server 4/66	164 00
92G7203 (8Meg)	Value Point Performance PC Server 4/66	359 00
92G7204 (16Meg)	Value Point Performance, PC Server 4/66	699 00
92G7205 (32Meg)	Value Point Performance, PC Server 4/66	1539 00
96F9290 (4Meg)	Standard 1x3 70 Simms	172 00
96F9291 (16Meg)	Standard 4x9-70 Simms	672 00
6450902 (2Meg)	56 57, 57SX,90 95 P-75 57SLC Value Point 77 486DX2 486SX SVR 85	90 00
60G1622 (16Meg)	PS/1, Value Point Perf	699 00
6450128 (4Meg)	57SX, 90, 95 P-75 57SLC 56, 56SLC P/S1 386SX Mod-2123, 2133 2155 Val Pt 77 486CS2, 486SX SVR85 Value Point 77 486DX2, 486SX, SVR 85	175 00
6450129 (8Meg)	35SX, 40SX	330 00
6450130 (8Meg)	56, 57, 57SX 90 95 P-75 57SLC Value Point 77 486DX2, 486SX, SVR 85	339 00
6451158 (4Meg ecc)	486 95XP, 95A (install in pairs)	209 00
6451159 (8Meg ecc)	486 95XP, 95A (install in pairs	409 00

IBM NOTEBOOK & LAPTOP MEMORY

8169098 (4Meg)	Thinkpad 500 510CS	199 00
8169099 (8Meg)	Thinkpad 500 510CS	369 00
8169113 (16Meg)	Thinkpad 510CS	869 00
79F0999 (2Meg)	LX40, N33SX PS Note Thinkpad 710T	103 00
79F1000 (4Meg)	LX40, N33SX, PS Note Tkpd 350, 350c, 710T PS Note 425	189 00
79F1001 (8Meg)	LX40, N33SX PS Note Thinkpad 710T	369 00
07G1415 (4Meg)	Thinkpad 750, 750c, 755 360	209 00
07G1416 (8Meg)	Thinkpad 750, 750c, 755 360	389 00
66G0094 (16Meg)	Thinkpad 750, 750c, 755 360	849 00
07G1420 (4Meg)	CL57LSX LpTp Thinkpad 700 700C, 720, 720C	209 00
07G1421 (8Meg)	CL57LSX LpTp Thinkpad 700 700C, 720, 720C	389 00
60G0378 (8Meg)	Thinkpad 350 350c, PS Note 425	339 00
60G0379 (16Meg)	Thinkpad 350 350c, PS Note 425	649 00
92F6604 (2Meg)	N45SL	109 00

COMPAQ MEMORY MODULES

MODEL	AMT UPGRADED	CMPQ PART #	PRICE
DeskPro 386/33, 386/33L,	2Meg Module	115144-001	139 00
486/25, 486/33L,	8Meg Module	116561-001	429 00
486/50L, System Pro	32Meg Module	116568-001	1459 00
DeskPro 386/33L, 486/33L	(Exp Bd)	116569-001	279 00
DeskPro 386/25, 386/20	1Meg Module	113131-001	79 00
	4Meg Module	113132-001	199 00
DeskPro 386S-16MHz	1Meg Exp Bd	113633-001	149 00
	4Meg Exp Bd	113634-001	279 00
	1Meg Module	113646-001	79 00
	4Meg Module	112534-001	199 00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149 00
DeskPro 386/25E	4Meg Exp Bd	113645-001	279 00
	1Meg Module	113131-001	79 00
	4Meg Module	113132-001	219 00
DeskPro 286N, 386N,	1Meg Module	118688-001	59 00
386SX/20, 386/25M, 486/33M,	2Meg Module	118689-001	89 00
486S/25M, 486S/16M	4Meg Module	118690-001	189 00
Port. I Series 486C	8Meg Module	128877-001	389 00
M Series Exp Bd	0-64Meg	129160-001	189 00
DeskPro 386/16	1Meg Kit	108071-001	99 00
	4Meg Kit	108072-001	299 00
	1-2Meg Exp Bd	108069-001	239 00
	4-8Meg Exp Bd	108070-001	437 00
DeskPro 286	512K Kit	113012-001	49 00
DeskPro 5/60, 5/66M 5/66M (ALL OF THESE MACHINES USE THESE MODULES)	8Meg Kit	149911-001	389 00
Prosignia 5/60	16Meg Kit	149949-001	707 00
Prollant 100 5/60	32Meg Kit	149912-001	1399 00
Prollant 2000 4/30, 5/68	64Meg Kit	149913-001	2700 00
Prollant 4000 4/50, 5/66	128Meg Kit	149914-001	5900 00
Prolinea 386 3/25S 3/25ZS	2Meg	141738-001	109 00
	8Meg	141742-001	338 00
Prolinea 486 4/25S 4/33 4/50, 4/66, CDS	2Meg	141683-001	95 00
Enhanced Prolinea Prosano series	4Meg	141684-001	175 00
	8Meg	141685-001	339 00
Prosignia PC Server, 486/33,	8Meg	141685-001	339 00
486 DSX/66	16Meg	149320-001	699 00
	32Meg	149147-001	1525 00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	2Meg Bd	117081-002	99.00
LTE/286	4Meg Bd	117081-003	179.00
LTE/386S/20	4Meg Module	121125-002	209 00
LTE LITE/20, 26, 25C	4Meg Module	129769-002	209 00
LTE LITE/20 25, 25C	8Meg Module	129769-003	409 00
LTE LITE/20, 25, 25C	16Meg Module	129769-004	809 00
LTE LITE 425C/33C/25E/255L	4Meg Module	142337-002	189.00
LTE LITE 425C/33C/25E/255L	8Meg Module	142337-003	349 00
LTE LITE 425C/33C/25E/255L	16Meg Module	142337-004	718 00
SLT/286	1Meg Module	110236-001	75 00
SLT/286	4Meg Module	110237-001	219 00
SLT/386	1Meg Module	118303-001	79 00
SLT/386	2Meg Module	118304-001	109 00
SLT/386	4Meg Module	118305-001	219 00
Concerto, LTE Elite	4Meg	144790-001	189.00
	8Meg	144790-002	369 00
	16Meg	144790-003	719 00
Contura 320 325	2Meg	139497-001	99.00
	4Meg	139498-001	189 00
	8Meg	139499-001	349 00
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	189 00
	8Meg	146521-001	339 00
	16Meg	146531-001	739 00
Aero 4/25, 4/33L	4Meg	190532-001	164 00
	8Meg	190597-001	374 00
	16Meg		799 00

NO SURCHARGE FOR MASTERCARD AMEX, VISA OR DISCOVER PURCHASE ORDERS ACCEPTED FROM FORTUNE 2000, GOVERNMENT & INSTITUTIONS California orders add 8 25% sales tax. Returned orders or ordered wrong parts are subject to a 20% restocking fee (Memory chips not installed in boards) We accept International orders shipped via UPS Air APO FPO orders welcome Customers are expected to pay customs and "other" charges if shipped Int'l All credit card charges verified for fraudulent use SORRY NO REFUNDS AFTER 30 DAYS – EXCHANGES ONLY If you receive defective merchandise we exchange only—no refunds We accept MC, VISA Discover AE prepaid orders purchase orders wire transfer COD (cashiers check) orders cash & cashiers checks Orders shipped by UPS FEDX must be signed for
• ALL MANFACTURER PART # S ARE FOR REFERENCE ONLY • MINIMUM ORDER $40 00

CUSTOMER SERVICE & TECHNICAL: OPEN M–F, 9–4 PST
All products Brand new & guaranteed • We buy excess inventory
Trademarks are registered with their respective companies.

L.A. TRADE

22825 Lockness Avenue • Torrance, CA 90501

TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU PART #	PRICE
T1000SE/XE/LE	2Meg	PC14-PA8312U	79 00
T2000/T2000SX	2Meg	PC18-PA8317U	79 00
T2000SX/T1000LE	4Meg	PC-PA8314U	189 00
T2000SX/T1000LE	8Meg	PC14-PA8315U	359 00
T2000SXE/2200SX/T1800, 1850, C	2Meg	PC-PA2000U	79 00
T2000SXE/2200SX/T1800, 1850 C	4Meg	PC-PA2001U	189 00
T2000SXE/2200SX/T1800, 1850, C	8Meg	PC-PA2002U	359 00
T4400SX, SXC T6400 T6600	4Meg	PC-PA2004U	199 00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	369 00
T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	699 00
T4500 C T4600 T4700, T1900 C T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	199 00
T4500 C T4600 T4700 T1900 C T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	389 00
T4500 C, T4600, T4700, T1900 C T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	769 00
T3300SL	6Meg	PC-PA2008U	266 00
T3300SL	16Meg	PC-PA2009U	699 00
T3400CT, T2400, T3600	4Meg	PC-PA2019V	194 00
T3400CT, T2400, T3600	8Meg	PC-PA2020V	369 00
T3400CT, T2400, T3600	16Meg	PC-PA2021V	763 00
T3400CT	32Meg		1549 00
T1200XE	2Meg	PC13-PA8306	99 00
T1600	2Meg	PC8-PA8302U	99 00
T3100	2Meg	PC3-PA7135E	139 00
T3100e	2Meg	PC9-PA8340U	109 00
T3100SX	2Meg	PC15-PA8308U	109 00
T3100SX	4Meg	PC15 PA8310U	189 00
T3200	3Meg	PC6-PA7137U	165 00
T3200SX	2Meg	PC12-PA8307U	119 00
T3200SX	4Meg	PC12-PA8909	199 00
T3200SXC	2Meg	PC19-PA8318U	119 00
T3200SXC	4Meg	PC19-PA8319U	199 00
T5100	2Meg	PC7-PA8301U	95 00
T5200/T8500	2Meg	PC10-PA8304U	114 00
T5200/T6500	8Meg	PC10-PA8313U	419 00

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT UPGRADED	MANU PART #	PRICE
ACER 730	2Meg/4Meg/8Meg		109/209/399
ACER 750	4Meg/8Meg/16Meg		199/459/869
ALR Ventura	4Meg	12407980	249 00
AST Ascentia 900N	4Meg/8Meg/16Meg		229/469/899
AST Bravo & Explorer	4Meg/16Meg	501255-001 -002	189/789
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814-003	189 00
AST Power Exec 3/25C, 425EL	4Meg		199 00
AST Power Exec 3/25C, 425EL	16Meg		819 00
AST Power Exec 425SL	4Meg	501166-001	199 00
AST Power Exec 425SL	16Meg	501166-003	819 00
AST Power Exec 4/33SL	4Meg/16Meg	501318-001,002	194/769
AT&T Safari NSX/20	4Meg	PEC 37651	259 00
Bondwell B310, Plus	1Meg	23050-09100	109 00
Bondwell B310V, SX	1Meg		109 00
Bondwell B310V, SX	4Meg		229 00
Canon Innova 486	2Meg/4Meg/8Meg		109/209/449
Canon Notejet 486	4Meg/ 8 Meg		199/389
Chicony, Ultra, Hyundai 386	4Meg		199 00
Epson NB3	4Meg	A808511	199 00
Everex Tempo LX, LX20, Carrier	2Meg	PCA 00053-0001	109 00
Gateway 2000 Colorbook 4/33	4Meg/16Meg		199/799
Gateway 2000 Nomad 425 DXL/SXL	4Meg/16Meg		199/1189
Gateway 2000 486 Hardbook	4Meg/16Meg		199/799
Goldstar GS520 386SX/16	4Meg	S386-4M	249 00
Grid 1720 1750 1755	1Meg		49 00
HP Omnibook	2Meg/4Meg		129/279
Magnavox Metalis	1Meg/4Meg	286 386SX	109/199
NCR Safari 3180	4Meg/ 8 Meg		229/449
NEC Prospeed 286 386SX-16	1Meg	PC21-21	79 00
NEC Prospeed 286, 386SX-16	4Meg	PC21-22	199 00
NEC Prospeed 386	2Meg	PC31-21	119 00
NEC Prospeed 386	8Meg	PC31-22	399 00
NEC Prospeed 386SX-20	1Meg	PC43-21	79 00
NEC Prospeed 386SX-20	4Meg	PC43 22	199.00
NEC Ultralite Versa	4 Meg/8Meg/16Meg/20Meg	OP4104	183/359/799/988
Packard Bell 386SX 286	1Meg 4Meg	286 386SX	109/199
Packard Bell Statesman	2Meg/8Meg		119/419
Panasonic CF170, CF270, CF370	1Meg	CF-BA165	49 00
Panasonic CF380, CF480	2Meg/4Meg/6Meg		119/199/309
Panasonic CF-V21P, CF-580	4Meg/16Meg		219/819
Sanyo 17/18 N6	2Meg	MBC-NBMEM2	109 00
Sharp 6781, 6881, 6785	2Meg/4Meg		109/199
Sharp PC-6220	1Meg	CE 6218	79 00
Tandon, PC Brand, Dataworld	2Meg/8Meg	NB386SX-20	118/429
TI Travelmate 2000	1Meg	2568034-0001	79 00
TI Travelmate 3000	2Meg	2566996-1	84 00
TI 4000 TI 4000E	4Meg/16Meg		199/999
Tandy 1610, 2810 3810	1Meg		49 00
Tandy 2820, 3820 3830	2Meg/4Meg/6 Meg		119/199/309
Twinhead, Altima Compudyne, 486SX, DX Tandy 4860	4Meg/16Meg		199/859
Ultra 486	2Meg, 4Meg, 6Meg		119/199/309
Zeos 386SX Notebook (not the + version)	2Meg		109 00
Zenith Master Sport 386SX	2Meg	ZA-300-1	114 00
Zenith Master Sport SL SLE, 800, 620, 625NL	2Meg	ZA-4-4	119 00
Zenith Super Sport 286, 286E	1Meg	ZA-180-66	99 00
286E, SX	2Meg	ZA-180-64	149 00
SX Alpha	2Meg	ZA-180-86	149 00
SX Beta	2Meg	ZA-180-87	149 00
Zenith Z-Note 325L, LC	2Meg/8Meg	ZA3250-4/5	126/419
Zenith Z-Note 425LN LNC LNP	4/8/16Meg		269/519/839

PCMCIA VERSION 2.0 (for Palmtop & Subnotebooks)

MODEL	PRICE	MODEL	PRICE
S-RAM Cards 1MEG	159 00	Lan Ethernet (10 Base T)	159 00
S-RAM Cards 2MEG	179 00	Lan Ethernet (Coax)	159 00
14 400/14,400 Data/Fax Modems	189.00	Visual Media (CD Rom, Tape Dr)	279 00
Readwriter Card	199 00	Bus Toaster™ (High speed SCSI II)	299.00
		.Wavjammer™ (16 bit stereo sound card)	319
		105 Mg Type III Hard Drive	457 00

FLASH MEMORY 2 5Meg–299 00 5 Meg–357 00 10Meg–555 00 20Meg–909 00
(Flash Memory Cards appear to the host computer as a hard disk drive In a DOS environment your system will see the flash card much like an IDE hard disk drive and assign it a logical drive (e g D) No battery to deal with Also all capacities come with data compression software to double the amount of flash memory

LASER PRINTER MEMORY UPGRADES

AMOUNT UPGRADED	0K Bd	256k	1	2	3	3.8	4	5	6	8	16	32
Canon LBP 430	–	–	60	–	–	–	189	–	–	–	–	-
Canon LBP 860	–	–	–	99	–	–	179	–	–	349	669	1249
Canon LBP4, 4Lite, 4plus	–	–	159	219	–	–	–	–	–	–	–	-
Epson 6000, Action Laser	–	–	–	139	–	–	229	–	–	–	–	-
Epson Action Laser II	–	–	89	–	208	–	–	327	–	*IN STOCK		
Epson 8000	–	–	69	–	208	–	–	327	–			
Epson 1000, 1500	–	–	–	*119**	–	–	*238**	–	*Call*	–	–	-
HP 2, 2D	–	–	–	109	–	–	189	–	–	–	–	
HP 3 3D 3P, 2P 2P+	–	–	–	99	–	–	169	–	–	–	–	-
HP 4, 4M 4SI 4SIMX, 4P 4MP	–	–	–	89	–	–	189	–	–	349	–	-
HP 4L	–	–	59	–	–	–	–	–	–	–	–	-
HP 3SI	–	–	69	–	–	–	169	–	–	349	–	-
HP 4SI	–	–	–	89	–	–	175	–	–	349	–	-
HP Design Jet 600, 650	–	–	–	–	–	–	175	–	–	349	-	-
HP Deskjet 500 500C, 510, 550,560	–	55	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	89	–	–	175	–	–	349	–	–
HP Paintjet XL300	109	–	–	–	–	–	289	–	–	489	837	-
IBM Laser 4019 4019E	–	–	–	–	–	169	–	–	–	–	–	–
IBM Laser 4029 4037	–	–	–	–	–	–	169	–	–	–	–	-
IBM Laser 4039 4079	–	–	–	99	–	–	169	–	–	350	–	-
NEC 90, 290	–	–	–	139	–	–	–	–	–	–	–	-
NEC 95, 97	–	–	–	99	–	–	–	–	–	–	–	-
Oki 400	–	–	–	89	–	–	–	–	–	–	–	-
Oki 400E, 400EX, 410E, 410EX	–	–	135	189	–	–	–	–	–	–	–	-
Oki 830, 840	–	–	–	109	–	–	–	–	–	–	–	-
Packard Bell PB 9500	–	–	–	139	–	–	227	–	–	–	–	-
Packard Bell 9815	–	–	–	180	–	–	299	–	–	–	–	-
Panasonic 4420/4450I	–	–	–	129	–	–	209	–	–	–	–	-
Panasonic 4410/4430	–	–	–	126	–	–	196	–	–	–	–	-
Panasonic 4450	–	–	99	–	–	–	–	–	–	–	–	-
Panasonic 4400/5400	–	–	Call	Call	–	–	Call	–	–	–	–	-
Panasonic 4440, 5410	–	–	109I	179I	–	–	Call	–	–	–	–	-
Sharp 9400, 9460 9600, 9700E	–	–	89	149	–	–	249	–	–	–	–	-
TI XL/PS17/PS35	–	–	55	–	–	–	–	–	–	–	–	-
TI Microwriter	–	–	79	159	–	–	–	–	–	–	–	-

H.P. COMPATIBLE FONT CARTRIDGE

BAR CODES Bar Code Reader Fonts	99 00
DESKJET SOLUTION for DkJt 500 & Plus, 92 Fonts, 4 5 pt-30 pt	99 00
IBM 4019, 4019E, FONT CARTRIDGE 209 Fonts, Turbo Card	105 00
TURBO 25 Comparable to Pacific Data's 25 CARTRIDGES IN ONE!™, 143 Fonts *(compat with Epson Action Laser II and all HP Printers except HP4)*	69 00
TURBOSCRIPT™ 109 109 Scalable Fonts to Any Point Size HP2D 3, 3D 3P 2P 2P+	149 00
TURBOSCRIPT™ 109 109 Scalable Fonts to Any Point Size HP2	179 00
TAX & FINANCE FOR IBM 4019, 4019E, 4028	139 00
TAX & FINANCE CARTRIDGE	84 00
DKI 400, 800 41 fonts, 11 typestyles	169 00

310-539-0019
FAX: 310-539-5844

Prices & Availability Subjet to Change Without Notice

CALL TOLL FREE **1-800-433-3726** (US and Canada)

ESTAB. 1985

SORRY, NO WILL CALLS

Mon-Fri, 8:00 a.m. to 5:00 p.m. PST
Sat. 10:00 a.m. to 12:00 noon

PRICES MAY FLUCTUATE. CALL FOR LATEST PRICING!!

BE CHOOSY!

Quantex gives you the choicest features at the choicest prices.

Some companies offer you plenty of features that wind up costing you plenty of money. Others lure you with low prices—for little more than a keyboard, a monitor, and a box. At Quantex, it's never one or the other. Quantex is dedicated to providing complete systems that are loaded with the latest technology, like our Multimedia Systems and Pentium™ Performers. With high quality and low prices, Quantex is the best value around. But you don't have to take our word for it. Go ahead and compare. You'll find that with Quantex, you can afford to be choosy.

Achieve Peak Multi-

Quantex brilliance enhances your ingenuity with

Whether you're working at home or in the office, when you've got work to do, you want it done right — and fast. That's what Quantex had in mind when we created these powerful multimedia systems. That's why we've bundled the easiest, handiest, no-nonsense software around into our systems. Like **Microsoft® Encarta, Microsoft Money**. And the award-winning **Borland® Office 2.0**.

Suite Victory

You want professional results no matter what you do. And that's the whole idea. So, we're helping the cause with **Borland Office 2.0**, a powerful software suite that incorporates three of PC Computing's Most Valuable Product award winners — **WordPerfect® 6.0** for **Windows™, Borland Paradox 4.5 and Borland Quattro Pro 4.5**.

Each of these applications were chosen to be the best for their capabilities and ease of use. To maximize productivity, Borland Office brings them together in a format that allows quick maneuverability among the word processing, spreadsheet and database applications, as well as convenient software management.

With Quantex's proven performance and Borland Office's indisputable efficiency, all you get is winning results.

Smooth Talking

When your ideas are good, you want to get them out fast. That's why Quantex has installed a 14,400 baud high-speed fax/modem into our multimedia system. Because faster transmission means lower on-line bills, you'll be saving as you're working.

QUANTEX
Microsystems, Inc.

Two Tower Center Blvd., East Brunswick, NJ 08816, Tel: (908) 563-4166, Fax: (908) 563-0407

media Performance

suite success.

What's more, Quantex has also hooked you up to **CompuServe**®, an on-line service that links you up with the world. Literally.

With CompuServe, you gain access to hundreds of forums, scores of professional groups, and over 17,000 databases! And with a one-month free subscription from Quantex, answers, advice and valuable information are right at your fingertips.

What's more, Quantex will also preload America On-Line and Prodigy® software into your multimedia system. This way, your world of information and communication possibilities is limitless!

The CD-ROM Resource

When it comes down to business, the multimedia advantage is mass storage. In addition to **Borland Office 2.0 on CD**, Quantex brings the multimedia advantage to you with **Microsoft Encarta**. It's a great investment in knowledge, with 29 volumes of information packed onto a single CD-ROM disc, illustrated with vivid graphics, sounds and video.

But Quantex knows that multimedia means enjoyment, too. And the **Kodak® Photo-CD Access Software** and **Photo Sampler** is sure to make you smile. With a wide array of browsing and editing functions, you can always relive the memories.

Service to Ease Your Mind

When it comes to a Quantex computer, you don't have to worry, period. Because not only are our computers guaranteed reliable, we back it up with comforting services and warranties. This includes a one-year Free Parts and Labor warranty, as well as one-year Free On-Site service. Plus, if you ever have a question, we give you lifetime toll-free technical support. What's more, we're so confident about the quality of our products, you get a 30-day money back guarantee, no questions asked. How's that for peace of mind?

intel inside

Multimedia Systems

Q486DX2/66VM-4 $1999

- IntelDX2™ 66 Processor
- 8MB RAM, 128KB Fast Cache
- 540MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- VESA Local Bus Graphics Accelerator, 16.7 million colors, 1MB exp. to 2MB
- VESA Local Bus IDE controller
- 15" Digital Color Monitor with Flat Screen and .28mm dot pitch
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- 14,400 Baud Fax/Modem w/software
- Double-spin CD-ROM drive, multisession Kodak Photo-CD ready
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 3 CD Discs: Borland Office 2.0*, Microsoft Encarta Encyclopedia , and Kodak Photo CD
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line software preloaded

Q486DX2/50VM-4 $1949
Q486DX4/100VM-4 $2299

QP5/60PM-2 $2299

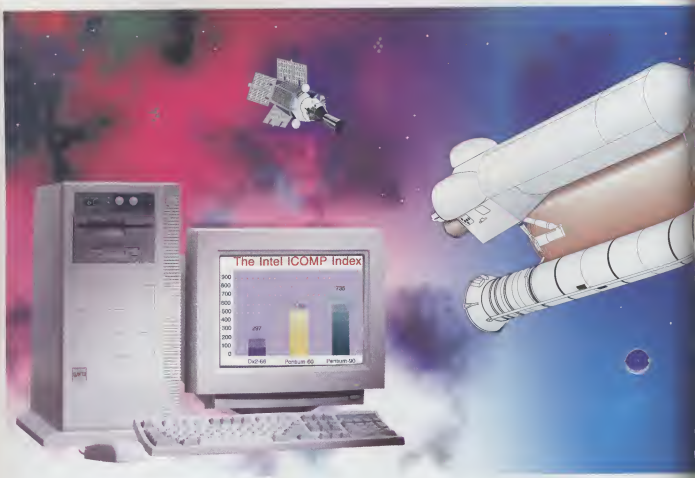
- Intel Pentium™ Processor
- 8MB RAM, 128KB Fast Cache
- 540MB 12ms IDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- 64-bit PCI Local Bus Graphics Engine, 16.7 million colors, 1MB exp. to 2MB
- PCI Local Bus Enhanced IDE controller
- 15" Digital Color Monitor with Flat Screen and .28mm dot pitch
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- 14,400 Baud Fax/Modem w/software
- Double-spin CD-ROM drive, multisession Kodak Photo-CD ready
- 16-Bit Stereo Sound Card w/speakers
- MS-DOS & WFW 3.11
- 3 CD Discs: Borland Office 2.0*, Microsoft Encarta Encyclopedia, and Kodak Photo CD
- MS-Money & MS-Entertainment Pack
- Prodigy, Compuserve, and America On-Line software preloaded

Q486DX2/66PM-2 $2079
QP5/66PM-2 $2449
QP5/90PM-2 $2649

1-800-787-8686

Demand Paramount

Quantex workstations pack raw power and pure



Quantex gives you maximum performance and power at a value our competition can't touch. These dual PCI-based workstations, now available with the awesome Pentium™ 90 Processor, blaze through all of your most demanding applications. And with the high-performance peripherals you deserve, Quantex workstations are ready for your most advanced graphics-intensive and computation-heavy software. Put it all together, and you get not only the full technological advantage, but the Quantex value advantage too.

Explosive PCI Power

Watch your most complex applications take off on a 132MB/sec throughput blast! The innovative PCI local bus was developed by Intel® for the most advanced processors and applications of today and tomorrow, so you know it's going to be exceedingly fast and completely compatible. With PCI's independent data transfer to all your peripherals, it supplies unsurpassed performance. And with the convenience of PCI's plug-and-play jumperless configuration, building on your system is a breeze. No more IRQ's or DMA's. It all adds up to unmatched performance and upgradability.

Nothing Less Than Dual PCI

When it comes to optimum system performance, two PCI is certainly better than one. That's why Quantex gives you both, a PCI video card and a PCI enhanced IDE controller. With increased throughput over a wider data path, this dual PCI system delivers every detail without delays. Since the PCI enhanced IDE controller is capable of supporting up to a full 8.4GB with 32-bit access, it transfers data to your hard drive at up to twice the speed of non-PCI systems.

QUANTEX
Microsystems, Inc.

Two Tower Center Blvd., East Brunswick, NJ 08816, Tel: (908) 563-4166, Fax: (908) 563-0407

Power
savings.

Blistering 64-Bit Video!

If your high-end applications are graphics-hungry, Quantex offers you the option of an awesome 64-bit video card. The on-board 64-Bit Graphics Engine, with increased system throughput, makes your applications cruise at extreme speeds. And the 64-bit display memory interface makes CAD/CAM vector calculations and high end desktop publishing applications a snap. Quantex also includes 2MB of memory, upgradable to 4MB, for faster display. And with its 16.7 million true-color palette, you'll get sharper, more vivid images. Plus, our systems have the flexibility to support your most advanced operating systems, like Windows NT and OS/2, and the latest high-end applications, like CAD/CAM and desktop publishing.

Don't Forget More Memory!

How much memory should your system have? The more the better for a full range of performance in present and future applications. That's why Quantex offers no less than 8MB in our powerful workstations. We know that today's software simply performs better with more RAM. And for CAD/CAM and desktop publishing applications, Quantex loads it up with 16MB. After all, it's what your applications need, and what you deserve, for now and for the future.

A High-Performance Warranty to Match Quantex delivers with a quality service package you can't resist. Like one-year of free On-Site Service. Our One-Year Free Parts and Labor Warranty. A no-questions asked, 30-day money back guarantee. And we'll even foot the bill for a lifetime of toll-free technical support. High performance systems from a high performance company. That's Quantex.

*Borland Office 2.0 for Windows is preloaded. Full printed manuals available at an extra charge. Quantex accepts prepaid checks, Visa, MasterCard, Discover, and Amex. Purchase orders from government agencies, universities, and Fortune 1000 companies also accepted. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantees; shipping charges are non-refundable. Prices and product descriptions subject to change without notice. Quantex Microsystems cannot be responsible for errors in typography or photography. The IntelDX2, Intel486, Pentium, OverDrive, and the Intel Inside Logo are trademarks of Intel Corporation in the USA and other countries. WordPerfect is a registered trademark of WordPerfect corporation within the United States and other countries. Some of the names or trademarks shown herein may be the property of other companies. Screen images simulated

PCI Workstations

QP5/60W-1 $1799

- Intel Pentium™ Processor
- 8MB RAM
- 256KB Fast Cache
- 420MB 12ms IDE Hard Drive with 128KB "CacheFlow Buffer"
- 3.5" 1.44MB Floppy Drive
- 64-bit PCI Local Bus Graphics Engine, 16.7 million colors, 1MB exp. to 2MB
- PCI Local Bus enhanced IDE controller
- 15" Digital Color Monitor with Flat Screen and .28mm dot pitch
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- MS-DOS & WFW 3.11

Q486DX2/66W-1	**$1599**
QP5/66W-1	**$1949**
QP5/90W-1	**$2149**

QP5/90W-2 $2799

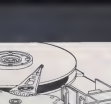
- Intel Pentium™ Processor
- 16MB RAM
- 256KB Fast Cache
- 730MB 10ms IDE Hard Drive with 128KB "CacheFlow Buffer"
- Double-spin CD-ROM drive, multisession Kodak Photo-CD ready
- 3.5" 1.44MB Floppy Drive
- 64-Bit PCI Bus Graphics Engine, 16.7 million colors, 2MB exp. to 4MB
- PCI Bus Enhanced IDE controller
- 14,400 Baud fax/modem w/software
- 15" Digital Color Monitor with Flat Screen and .28mm dot pitch
- 11-Bay Mid-Tower case
- 101-Key enhanced keyboard & Mouse
- MS-DOS & WFW 3.11
- Prodigy, Compuserve, and America On-Line software preloaded

Q486DX2/66W-2	**$2249**
QP5/60W-2	**$2449**
QP5/66W-2	**$2599**

1-800-787-8686

MEGA HAUS
HARD DRIVES

Your Drive Company!



UNEQUALED REPUTATION
Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 8 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

DIRECT REPLACEMENT WARRANTY
During the first year of your warranty, we replace: not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

SAME DAY SHIPPING
Our multi-million dollar inventory offers you the best diversity and availability in the market. We ship most orders the same day. Each order is checked at least four times for accuracy.

FAST, EASY INSTALLATION
Anyone can sell you a hard drive. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick precise installation guides for each kit.

UNBEATABLE DEALS

WESTERN DIGITAL
41 IDE drives. 3 year warranty, 128K read / write disk cache. MegaHaus unbeatable price!

420MB	12ms	WDAC2420	$225
540MB	12ms	WDAC2540	$315
730MB	10ms	WDAC2700	$425

SyQuest
INCLUDES 1 FREE DISK!
The industry standard in removable media. 3 1/2" form factor. IDE interface, SCSI also available.

105MB	14.5ms	SQ3105A	$229
270MB	13.5ms	SQ3270A	$489

MICROPOLIS
Best buy large capacity drives! 5 year advanced replacement warranty. MegaHaus unbeatable price! Choose IDE or SCSI.

1050MB	8.5ms	MC4110	$649
1740MB	10ms	MC2217	$899

adaptec
#1 SCSI disk controllers. Includes EZ-SCSI.

16Bit	ISA	A1522BASIC	$119
16Bit	ISA	A1542CFBASIC	$225
32Bit	EISA	A2742ABASIC	$319

Seagate
Baracuda drives, 7200rpm, 1MB buffer. FAST! MegaHaus unbeatable price! WIDE SCSI in stock.

1690MB	8ms	ST11950N	$1329
2130MB	8ms	ST12550N	$1499
4290MB	8ms	ST15150N	$2699

IBM
Quality IDE hard drives, 3yr wty, 4500rpm.

364MB	12ms	70G8488	$235
527MB	12ms	70G8486	$329
728MB	12ms	70G8511	$399

HARD DRIVES

CONNER

IDE			
210MB	14ms	CFS210A	$195
420MB	14ms	CFS420A	$245
541MB	12ms	CFS540A	$339
811MB	10ms	CFA810A	$499
1080MB	9ms	CFP1080A	$599

Maxtor

IDE			
170MB	15ms	7170A	$195
540MB	12ms	7546A	$299

MICROPOLIS

IDE			
1050MB	10ms	MC4110A	$649
1740MB	10ms	MC2217A	$899
SCSI			
1052MB	8.5ms	MC4110	$649
1740MB	10ms	MC2217	$899
3020MB	11ms	MC1936	$1899
SCSI-AV Audio/Visual tuned drives			
1000MB	10ms	MC2210AV	$749
1700MB	10ms	MC2217AV	$999
3000MB	11ms	MC1936AV	$2119

Seagate

IDE			
213MB	16ms	ST3243A	$185
260MB	16ms	ST3290A	$216
341MB	13ms	ST3391A	$238
420MB	14ms	ST3491A	$253
545MB	12ms	ST3660A	$349
SCSI (WIDE SCSI also available)			
1690MB	8ms	ST11950N	$1325
1700MB	9ms	ST11900N	$1089
2145MB	8ms	ST12550N	$1499
2146MB	9ms	ST12400N	$1199
4290MB	9ms	ST15230N	$2299
4290MB	8ms	ST15150N	$2699

WESTERN DIGITAL

IDE			
341MB	12ms	AC2340	$219
425MB	12ms	AC2420	$225
540MB	11ms	AC2540	$315
730MB	10ms	AC2700	$425
1083MB	10ms	AC31000	$599

HARD DRIVES

Quantum

IDE			
270MB	12ms	LPS270A	$219
342MB	12ms	LPS340A	$249
541MB	12ms	LPS540A	$329
SCSI			
170MB	14ms	ELS170S	$199
270MB	12ms	LPS270S	$239
342MB	12ms	LPS340S	$265
541MB	12ms	LPS540S	$385
1080MB	10ms	LMP1080	$675
1440MB	9.5ms	IMP1440S	$885
2160MB	9.5ms	IMP2160S	$1199

IBM
SCSI (WIDE SCSI also available)

1052MB	8.6ms	0662S12	$689
2040MB	9.2ms	0664N11	$1199
4250MB	11ms	0664CSH	$2239

IBM PS/1 PS/2 DRIVES
Complete solutions for your IBM Larger sizes in stock! 210MB 410MB 540MB
PS/1 386 SX $299 $399 $499
PS/2
25, 30, 30-286 $299 $399 $499
35 & 40 $269 $369 $469
50 thru 95 $389 $499 $599

CONTROLLER CARDS

ADAPTEC	Alone	w/Drive
A1522BASIC 16Bit SCSI	$119	$109
A1542CBASIC 16Bit SCSI	$225	$215
A2742 EISA SCSI	$319	$309
A2842 VESA SCSI	$279	$269
PCI SCSI & WIDE	$325	$309
ALPHA RESEARCH CACHING CARDS		
8425I 16Bit IDE	$99	$89
8475I 32Bit Local Bus IDE	$139	$129
8485I 32Bit PCI IDE	$229	$219
8425S 16Bit SCSI	$229	$219
8475S 32Bit Local Bus SCSI	$369	$359

Many other types of controllers in stock.

CD ROM DRIVES

NEC	CDR900	4X	180ms	$939
NEC	CDR510	3X	195ms	$569
Plextor	PX43CH	4X	150ms	$475
Toshiba	XM3401	2X	390ms	$269
Toshiba	XM4101	2X	320ms	$219
Teac	CD50	2X	265ms	$209

Pioneer External CD Changers (300ms)

DRM602X	6 disc	307KB/sec	$869
DRM604X	6 disc	612KB/sec	$1149
DRM1804X	18 disc	612KB/sec	$2099

MULTIMEDIA KITS
SCSI Drive, sound card (in retail pkg)
MVideo Vision Pro Audio 16, MSoftVideo Vision Pro Studio 16
Mbe Sound Blaster 16 SCSI. SbAw Sound Blaster SCSI ASP.

	MV	MS	SB	SA
XM4101	$330	$349	$359	$425
CD50	$330	$349	$359	$425
XM3401	$399	$419	$425	$479
CDR510	$489	$525	$529	$589
PX43CH	$629	$649	$659	$699
CDR900	$1099	$1119	$1129	$1189

CD ROM TOWERS
CD ROM Drive Towers - Multiple CD ROM drives in a single external enclosure. Great for networks, BBS, or business.

	2 Drive	4 Drive	7 Drive
XM4101	$569	$1199	$1999
CD50	$569	$1199	$1999
XM3401	$669	$1499	$2499
CDR510	$859	$1899	$3299
PX43CH	$1089	$2529	$4299
CDR900	$2119	$4339	$7489

BUNDLE SPECIALS WITH ANY CD DRIVE PURCHASE!
Free $25 ADI Photo CD processing coupon with each CD ROM Drive!
6 Title CD Bundle $69
Illustrated Encyclopedia, World Atlas, Mavis Beacon Teaches Typing, San Diego Zoo's Animals, US Atlas, Chessmaster 3000!
Caddies $5 Macintosh CD Driver $29
Altec Lansing ACS-100 Speakers $109

TAPE DRIVES

IOMEGA
250MB Tape Drive
5Yr Warranty!
QIC-80 compatible, includes backup software & 1 FREE tape *Lose when Internal Fits 3.5 or 5.25 bay* $159 $149
External for printer port $319 $309

3 Pack of IOMEGA formatted DC2120 tapes $40 with any purchase!

SCSI Tape Drives - Kits include 16bit card, software & 1 tape

			Bare	Kit
250-13GB	Exabyte	2501	$499	$699
2Gig	Conner	4320	$749	$899
2Gig	HP	35470	$899	$999
4-8Gig	Conner	4324	$999	$1100
4-8Gig	HP	35480	$989	$1089
4-16Gig	Sony	SDT5000	$1029	$1169
4-16Gig	HP	C1533A	$1379	$1379

OPTICAL DRIVES

Sony CDU
High quality, High Performance optical drive solution for controller, and 1 disk. Get "Dare to Compare" FAX

128MB $769	230MB $969	1300MB $2299

HP & Maxoptix drives & media in stock. Verbatim Optical Media (Qty 5 price).

128MB / 650MB / 1.3Gig	$35 / $77 / $185	

HARD DISK CARDS
Drive & controller on card. Saves drive bay. Compatible with XT, AT, Bandy, PS2 and others. Super easy installation! IDE

210MB	$299	420MB	$399	540MB	$499

MISCELLANEOUS

	Alone	w/HD
TEAC Floppy Drives		
Floppy 1.4 (1.2 + $9)	$45	$42
Floppy Combo 1.4 & 1.4	$115	$110
Maxtor 105MB PCMCIA drive	$129	
PCMCIA to SCSI adapter	$319	
Desktop Drive Module Mounts 3 x 5 1/4" drive bay. Allows you to use any PCMCIA in your desktop	$139	

VISA MasterCard DISCOVER AMERICAN EXPRESS

1-800-786-1187

Ad. Code # CA91 Sales Hours (Central Standard Time)
8am - 7pm Monday thru Friday 9am - 3pm Saturday
FAX (713) 333-3024 Local (713) 333-1910
We sell within the United States, its territories, and Canada (sorry no international orders)

Circle 105 on reader service card.

MEGA HAUS HARD DRIVES
1110 NASA Rd 1 #306
Houston, Texas 77058

NO SURCHARGE
We accept Fortune 500 & Government bids & PO's.
We check for COD and Cashier's Money Orders!

Prices & specifications subject to change without notice. Shipping charges are nonrefundable. Returns must be in new condition and in original packaging. Defective items may vary warranties. No refunds on software or special orders (items not listed). All items subject to prior sale. Shipping charges are not refundable. Shipping charges are estimated. All trademarks are trademarks of their respective companies. Reserve check for clearance. We reserve the right to refuse any sale for any reason. ©1994 MegaHaus Inc.

Be a computer programmer!

Only NRI gives you hands-on training with a 486sx Multimedia PC:

■ A 486sx computer with Super VGA color monitor, 200 meg hard drive ■ CD-ROM drive and sound card ■ Windows ■ Visual Basic ■ Power C ■ QBasic ■ MS-DOS 6.2

Only NRI at-home training gives you real-world programming skills in three in-demand languages: QBasic, C, and Visual Basic, today's hot new language designed for writing popular Windows applications. Best of all, you get hands-on training with a powerful Multimedia PC, featuring an Intel-based 486sx computer, Super VGA color monitor, 200 meg hard drive, CD-ROM drive with sound card, and professional software you keep!

and clients demand...even multimedia programs!

Only NRI gives you first-hand programming experience with a state-of-the-art Intel-based 486sx computer system, complete with Super VGA color monitor, 200 meg hard disk drive, 5 full megabytes of RAM, CD-ROM drive and sound card, 1.44 meg 3.5" floppy

NRI's step-by-step lessons and hands-on programming projects help you first master the design concepts used every day by successful PC programmers. Then, with the support of your experienced NRI instructor, you quickly move on to learn programming in three of today's hottest languages.

By the time you complete your course,

Rush this postage-paid card for your free catalog!

Every NRI course features practical, hands-on training with state-of-the-art equipment you keep. Only NRI gives you the training and the equipment for career advancement, part-time earnings, or even a business of your own.

Check one ☑

Please send my FREE catalog on NRI training in:

- ❑ **Computer Programming**
- ❑ Microcomputer Servicing
- ❑ Multimedia Specialist
- ❑ Programming in C++ with Windows
- ❑ Desktop Publishing & Design
- ❑ Word Processing Home Business
- ❑ TV/Video/Audio Servicing
- ❑ Database Management
- ❑ Industrial Electronics & Robotics
- ❑ Electronic Music Technology
- ❑ Basic Electronics
- ❑ Computer-Aided Drafting
- ❑ Home Remodeling
- ❑ Automotive Servicing
- ❑ Locksmithing
- ❑ Paralegal
- ❑ Fiction/Nonfiction Writing
- ❑ Interior Design
- ❑ Bookkeeping & Accounting

Name (Please print) Age

Address (No P.O. Box numbers please)

City/State/Zip

Accredited Member National Home Study Council 5408-0994

For career courses approved under G.I. Bill, ❑ check for details

Rush this postage-paid card for your free catalog!

Every NRI course features practical, hands-on training with state-of-the-art equipment you keep. Only NRI gives you the training and the equipment for career advancement, part-time earnings, or even a business of your own.

Check one ☑

Please send my FREE catalog on NRI training in:

- ❑ **Computer Programming**
- ❑ Microcomputer Servicing
- ❑ Multimedia Specialist
- ❑ Programming in C++ with Windows
- ❑ Desktop Publishing & Design
- ❑ Word Processing Home Business
- ❑ TV/Video/Audio Servicing
- ❑ Database Management
- ❑ Industrial Electronics & Robotics
- ❑ Electronic Music Technology
- ❑ Basic Electronics
- ❑ Computer-Aided Drafting
- ❑ Home Remodeling
- ❑ Automotive Servicing
- ❑ Locksmithing
- ❑ Paralegal
- ❑ Fiction/Nonfiction Writing
- ❑ Interior Design
- ❑ Bookkeeping & Accounting

Name (Please print) Age

Address (No P.O. Box numbers please)

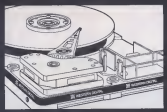
City/State/Zip

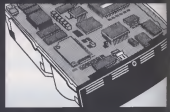
Accredited Member National Home Study Council 5408-0994

For career courses approved under G.I. Bill, ❑ check for details

MEGAHAUS HARD DRIVES

Your Drive Company!





UNEQUALED REPUTATION

Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 8 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

DIRECT REPLACEMENT WARRANTY

During the first year of your warranty, we replace: not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

SAME DAY SHIPPING

Our multi-million dollar inventory offers you the best diversity and availability in the market. We ship most orders the same day. Each order is checked at least four times for accuracy.

FAST, EASY INSTALLATION

Anyone can sell you a hard drive. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick precise installation guides for each kit.

UNBEATABLE DEALS

WESTERN DIGITAL

#1 IDE drives. 3 year warranty, 128K read / write disk cache. MegaHaus unbeatable price!

420MB	12ms	WDAC2420	$225
540MB	12ms	WDAC2540	$315
730MB	10ms	WDAC2700	$425

MICROPOLIS

Best buy large capacity drives! 5 year advanced replacement warranty. MegaHaus unbeatable price! Choose IDE or SCSI.

1050MB	8.5ms	MC4110	$649
1740MB	10ms	MC2217	$899

Seagate

Baracuda drives, 7200rpm, 1MB buffer. FAST! MegaHaus unbeatable price! WIDE SCSI in stock.

1690MB	8ms	ST11950N	$1329
2139MB	8ms	ST12550N	$1499
4290MB	8ms	ST15150N	$2699

SyQuest

INCLUDES 1 FREE DISK!

The industry standard in removable media. 3 1/2" form factor. IDE interface, SCSI also available.

105MB	14.5ms	SQ3105A	$229
270MB	13.5ms	SQ3270A	$489

adaptec

#1 SCSI disk controllers. Includes EZ-SCSI.

16Bit	ISA	A1522BASIC	$119
16Bit	ISA	A1542CFBASIC	$225
32Bit	EISA	A2742ABASIC	$319

IBM

Quality IDE hard drives, 3yr wty, 4500rpm.

364MB	12ms	70G8488	$235
527MB	12ms	70G8486	$329
728MB	12ms	70G8511	$399

HARD DRIVES

CONNER

IDE			
210MB	14ms	CFS210A	$195
420MB	14ms	CFS420A	$245
541MB	12ms	CFA540A	$339
811MB	10ms	CFA810A	$499
1080MB	9ms	CFP1080A	$599

HARD DRIVES

Quantum

IDE			
270MB	12ms	LPS270A	$219
342MB	12ms	LPS340A	$249
541MB	12ms	LPS540A	$329
SCSI			
170MB	14ms	ELS170S	$199

CD ROM DRIVES

NEC	CDR900	4X	180ms	$939
NEC	CDR510	3X	195ms	$369
Plextor	PX43CH	4X	150ms	$475
Toshiba	XM3401	2X	200ms	$269
Toshiba	XM4101	2X	320ms	$219
Teac	CD50	2X	265ms	$209
Pioneer External CD Changers (300ms)				
DRM602X	6 disc	307KB/sec		$869

TAPE DRIVES

IOMEGA

250MB Tape Drive 5YR Warranty!

QIC-80 compatible, includes backup software & 1 FREE tape

	Alone	w/drive
Internal fits 3.5 or 5.25 bay	$159	$149
External for printer port	$319	$309

3 Pack of IOMEGA formatted

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BE ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BE ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

Be a computer programmer!

Only NRI gives you hands-on training with a 486sx Multimedia PC:

■ A 486sx computer with Super VGA color monitor, 200 meg hard drive ■ CD-ROM drive and sound card ■ Windows ■ Visual Basic ■ Power C ■ QBasic ■ MS-DOS 6.2

Only NRI at-home training gives you real-world programming skills in three in-demand languages: QBasic, C, and Visual Basic, today's hot new language designed for writing popular Windows applications. Best of all, you get hands-on training with a powerful Multimedia PC, featuring an Intel-based 486sx computer, Super VGA color monitor, 200 meg hard drive, CD-ROM drive with sound card, and professional software you keep!

NRI, the leader in at-home computer training, shows you how to take advantage of today's newest programming opportunities

Get in on the ground floor of computer programming, one of today's fastest-growing career fields. The Bureau of Labor Statistics forecasts that job opportunities for programmers will increase *much* faster than average over the next 10 years, with as many as 400,000 *new* jobs opening up by 2005.

And the fastest-growing segment of programming jobs will be PC programming, fueled by the phenomenal popularity of Windows, the efficient power of C, and the rise of exciting new languages like QBasic and Visual Basic.

Now, with NRI at-home training, you can get the new skills you need to build a top-paying career — even a full- or part-time business of your own — in this high-growth, high-opportunity field.

Get hands-on experience with today's programming tools: a powerful 486sx multimedia computer, color monitor, 200 meg hard drive, CD-ROM drive, Windows, Visual Basic, and more!

Right from the start, NRI's unique Discovery Learning Method gets you actively involved in the challenge of real-world programming. Step by step, you learn to create the kinds of full-featured, powerful programs today's employers and clients demand...even multimedia programs!

Only NRI gives you first-hand programming experience with a state-of-the-art Intel-based 486sx computer system, complete with Super VGA color monitor, 200 meg hard disk drive, 5 full megabytes of RAM, CD-ROM drive and sound card, 1.44 meg 3.5" floppy drive, mouse, and more — an MPC system that's yours to train with and keep!

Plus you explore the extraordinary capabilities of three in-demand programming languages. You learn to design, code, run, debug, and document programs in QBasic, C, and Visual Basic. Best of all, since Visual Basic is specifically designed for creating Windows applications, you learn to generate fully functioning Windows programs, complete with text boxes, command buttons, and other sophisticated graphical interface elements.

No previous experience necessary

Train with NRI, and immediately start getting the money-making job skills you need to be a computer programmer — no matter what your previous background.

NRI's step-by-step lessons and hands-on programming projects help you first master the design concepts used every day by successful PC programmers. Then, with the support of your experienced NRI instructor, you quickly move on to learn programming in three of today's hottest languages.

By the time you complete your course, you have a clear understanding of programming methods, languages, and techniques... and you're ready to handle any programming task with confidence.

Send today for your FREE catalog

See how NRI at-home training gives you the programming know-how, the computer, and the software you need to get started in this top-paying field. Send today for your FREE catalog!

If the coupon is missing, write to us at the NRI School of Computer Programming, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

IBM is a registered trademark of the IBM Corporation. Windows, QBasic, and Visual Basic are trademarks of Microsoft Corporation. Intel Inside logo is a registered trademark of Intel, Inc.

FREE CATALOG! CALL 1-800-321-4634

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW, Washington, DC 20008

☐ For career courses approved under GI Bill, check for details

☑ **Check one FREE catalog only**

☐ **COMPUTER PROGRAMMING**
- ☐ PC Applications Specialist
- ☐ Programming in C++ with Windows

Other Computer Career Courses
- ☐ Microcomputer Servicing
- ☐ Desktop Publishing
- ☐ Bookkeeping and Accounting
- ☐ Multimedia Specialist

Name (please print) Age

Address

City/State/Zip

Accredited Member, National Home Study Council

5408-0994

20,000 PRODUCTS 24 HOURS A DAY.

NETWORKING

3Com

Etherlink III BNC 3C5Ø9 ... 115
Etherlink III BNC 5pk 3C5Ø9 ... 499
Etherlink III BNC 20pk 3C5Ø9CØ ... 1,949
Etherlink III TP 3C5Ø9TP ... 119
Etherlink III TP 5pk 3C5Ø9T-5 ... 499
Etherlink III TP 20pk 3C5Ø9T2Ø ... 1,999
Etherlink III Combo TP/BNC ... 129
Etherlink III Combo TP/BNC 5pk ... 539
Etherlink III EISA BNC ... 239
Etherlink III EISA BNC 5pk ... 1,049
Etherlink III EISA TP 3C579TP ... 239
Tokenlink III 3C619 ... 479

ARTISOFT

Lantastic 6.0 1 user 3 5" NWAS9ØØ16Ø $89
Lantastic 6 0 St Kit BNC (2) Noderunner/SI 2000/C NWAS9ØØ26Ø ... 349
Lantastic 6.0 Add on BNC/ oderunner/SI SI 2000/C NWAS9ØØ36Ø ... 159
Lantastic 6 0 Add on TP Noderunner/SI 2000/T NWAS9ØØ46Ø ... 159
Lantastic 6.0 5 usar 3.5" NWAS9ØØ56Ø . 349

SMC

Ethernet+ Elite 16T ... $110
Ethernet+ Elite 16T 6 Pack ... 129

Thomas Conrad

TC-4045 16/4 Token Ring ... $349

intel

Intel Ether Express 16 ... $99
Intel Ether Express 16TP ... 105
Intel Ethar Express FlashC ... 129
Intel Ether Express EISA Coax ... 429

Novell Netware V 4.01*

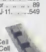
*Availabla only on CD

5 User ... $829
50 User ... 3,699
100 User ... 4,999
250 User ... 8,999
1000 User ... 27,999

Xircom

PE3-10B2 Pocket Ethemet BNC ... $269
PE3-10BC Pocket Ethemet combo ... 299
PE3-10BT Pocket Ethemet TP ... 269
PPX-03 Perellel Port Multiplexor ... 89
PT02-16BT Token Ring 16/4 RJ-11 ... 549

MEMORY/SIMM



Kingston

1MB x 9 80ns ... $Cell
1 MB x 9 70ns ... Cell
256KB x 9 70ns ... Call
4MB x 9 70ns ... Cell
512 x 36 2MB ... Cell
1 x 36 4MB ... Call
2 x 38 8MB ... Cell
4 x 38 16MB ... Cell

PCMCIA CARDS

AT&T

AT&T Faxmodem 14 4/14 4 ... $299

Megahertz

14 4/14 4 PCMCIA Faxmodem XJeck ... $219
96/24 PCMCIA Faxmodem XJeck ... 95
96/96 PCMCIA Faxmodem XJeck ... 169
14.4/14.4 PCMCIA Gold Faxmodem ... 239

intel

96/24 PCMCIA Faxmodem ... $119
96/96 PCMCIA Faxmodem ... 179
14.4/14 4 PCMCIA Faxmodem ... 189
96/24 PCMCIA Faxmodem ... 139
96/96 PCMCIA Faxmodem ... 229

Hayes

Optima 14 4/14.4 PCMCIA Faxmodem ... $265

Practical Peripherals

Practicard 14 4/14 4 PCMCIA Faxmodem ... $275

Xircom

Network combo ... 259
Network RJ-45 ... 219
Network BNC ... 219

US Robotics

Worldport 14 4/14 4 PCMCIA Faxmodem 195
Worldport 96/24 PCMCIA Faxmodem ... 199

INTEL OVERDRIVE

intel

OvarDrive 486SX20 ... $329
OverDriva 486SX25 ... 439
OverDrive 486DX25 ... 449
OverDrive 486DX33 ... 579

MODEMS

intel

14.4/14 4 Intamal Fexmodem ... $119
14 4/14 4 Intemal Fexmodem ... 129
14 4/14.4 Extemel Fexmodem ... 139
14 4/14.4 SatisFAXtion 400 Intemel ... 275
14 4/14.4 SatisFAXtion 400E Externel 309

Hayes

Optime 14 4/14 4 External Modem ... $369
Optime 14 4/14 4 External Faxmodem 379
Optima 96/96 External Faxmodam ... 355
Ultra 96 Externel Modem ... 559
Optima 24 Extarnal Modem ... 109
Accura 24 Externel Modem ... 75
Optima 144 PCMCIA Faxmodem ... 265

Practical Peripherals

Proclass 14 4/14.4 Intamal Faxmodem ... 139
Proclass 14.4/14 4 External Faxmodem ... 149
Proclass 28 8/14 4 Internal Faxmodem ... 259
Procless 28 8/14 4 External Faxmodem ... 369
Practicard 14 4/14 4 PCMCIA Faxmodem 299
Series II 14 4/14 4 Intemal Faxmodem ... 105
Series II 14 4/14.4 Extemal Faxmodem ... 119

US Robotics

Sportstar 14 4/14.4 Internal Modem $115
Sportster 96/96 Internal Faxmodem ... 125
Sportster 14 4/14.4 Int Fexmodem ... 119
Sportstar 28 8/28.8 Ext. Faxmodem ... 245
Sportster 28 8/28 8 Int. Faxmodem ... 225

SOFTWARE

The lowest prices on thousands of titles.

MONITORS

IDEK

17" Idek VisionMaster CMID8617 ... 769
21" Idek 8621 CMID8621 ... 2,295

NEC

14" MultiSync SVGA CMNEC14 ... $295
15" MultiSync 3V CMNEC3V ... 459
15" MultiSync 4FGE CMNEC4FGE ... 609
17" MultiSync 5FGE CMNEC5FGE ... 979
17" MultiSync 5FGP CMNEC5FGP 1,099
21" MultiSync 6FGP CMNEC6FGP 1,979

MAG

15" MAG CMDX15 ... 379
17" MAG CMDX17 ... 679

UPS

APC American Power Conversion

Backup-UPS 200 ... $89
Beckup-UPS 280 ... 99
Backup-UPS 400 ... 169
Backup-UPS 450 ... 189
Beckup-UPS 600 ... 259
Backup-UPS 900 ... 369
Backup-UPS 1250 ... 499
Personal SurgaArrest w/Telephone ... 29
Professional SurgeArrest w/Telephone . 39
Network SurgeArrest w/Telephone ... 49

UPSONIC

PC Might 25 ... $89
PC Might 35 w/FREE software ... 149
PC Might 55 w/FREE software ... 239
Upsever Softwara ... 49

TrippLite

BC250 ... $99
BC400 ... 159
BC400LAN ... 169
BC500LAN ... 199
BC 600LAN ... 249
BC750LAN ... 309
BC 900LAN ... 359
Isotel, 4 outlets w/RJ11 ... 49
Isobar 4 ... 39

Double speed!

CD-ROM DRIVES

CHINON

CDS535 Bare ... $359 Kit ... $429

NEC

3xi Internal Bere ... $429 Kit ... $499
3xi External Bera ... $459 Kit ... $529
4x External Bare ... $899

Talon

Talon Bare 320ms/300KB ... $149
Talon DS-200 245ms/330KB ... 349
Mitsumi Bare ... 159

PLEXTOR

Modal DM-3028
Intarnal bare ... $269 Kit ... $299
External bare ... 379 w/controller ... 409
4-Plex Internel ... 475 16-bit Kit ... 569

TOSHIBA

Model 3401 Bera . $359 Kit .. $429

MULTIMEDIA

CREATIVE

Sound Blester Pro Deluxe ... $89
Sound Blaster MIDI Kit ... 59
Sound Blaster 16 Multi-CD ... 169
Sound Blester 16CD ASP ... 209
Sound Blaster 16 SCSI ... 199
Sound Blaster Deluxa ... 69
Sound Blester 16 SCSI ASP ... 219
Sound Blester 16 Besic ... 119
Sound Blaster Pro Deluxe 8 Bit ... 89
SBS3ØØ Yemehe Speeker Set ... 99
Video Spigot for Windows ... 249
Video Blaster ... 349
Wave Blaster Board ... 189

Media Vision

Pro AudioSpectrum 16 SoundCerd ... $129
ProAudio Studio 18 w/mic ... 169
ProMovie Spectrum ... 309
RENO Externel CD-ROM Drive ... 289
Femily Deluxe MM Kit ... 339
Super Deluxe MM Kit ... 419
Premium Deluxe MM Kit ... 519
Pro Deluxe MM Kit ... 719

REVEAL

MultimediaFX-01 ... $279
MultimedlaFX-04 - Int. drive double speed, 300KB transfer, 16 Bit sound, speakers, microphone and 15 titles $449
MultimedlaFX-08 - Int drive double speed, 300KB transfer, 16 Bit sound, speekars, microphone and 35 titles. $579

REMOVABLE STORAGE

FUJITSU

Fujitsu Int MO 230MB (PC) ... $999
Fujitsu DynaMO 230 (Mac or PC) ... 999
Bernoulli 9Ø Pro Intarnal Kit ... 399

Barnoulli Multidlak Inelder 150 IDE

210MB Kit BEMD21ØK ... $399
505MB Kit BEMD5Ø5K ... 599
1050MB Kit BEMD1Ø5ØK ... 799

PRINTERS

Canon

BJ-10SX Portable Bubble Jet ... $249
BJ-200E Bubble Jet ... 289
BJ-230 Wide Carnege Bubble Jet ... 399
BJC-600 Color ... 589
LASER LBP 43Ø ... 589
LASER LBP 86Ø ... 1,389

EPSON

LX 300 9 pin Dot Matrix ... $169
LO-570+ 24 pin Dot Matrix ... 239
LO-870 24 pin Narrow ... 439
LO-1Ø7Ø+ 24 pin Wide Carriage ... 359
LO-2550 Color Dot Matrix ... 879
DFX 5000+ High Speed ... 1,379
Stylus 800 Inkjet ... 319
Stylus 1000 Inkjet ... 445
Action Printar 3260 Dot Matrix ... 199
Stylue Color Inkjet ... 579
Action 1600 6 ppm Laser ... 995

HEWLETT PACKARD

DeskJet 310 Portable Ink Jet ... $289
DeskJet 500C Ink Jet color ... 349
DeskJet 56ØC Ink Jet color ... 539
DeskJet 520 Ink Jet ... 279
LaserJat 4L 4 ppm Laser ... 649
LaserJet 4P 600 DPI Laser ... 985
DeskJet 1200CS ... 1,425
DeskJet 1200PS ... 2,089

LEXMARK by IBM

2380 Plus 9 pin Dot Matrix ... $319
2381 Plus 9 pin Wide Camage ... 449
2390 Plus 24 pin Dot Matrix ... 329
2391 Plus 24 pin Wide Camage ... 445
4Ø37 5E 5 ppm Laser ... 649
4Ø39 10R 10 ppm Laser ... 1,339
4Ø39 12R Plus 12 ppm Laser ... 1,489
4Ø76 Exec Jet II Inkjet ... 279

NEC

P62ØØ 24 Pin ... $409
P63ØØ 24 Pin ... 629
Silentwriter 1Ø97 ... 1,399

OKIDATA

OL41ØE Laser ... $829
OL81Ø Leser ... 929
OL85Ø Laser ... 1,239
ML38Ø Dot Metrix ... 219
ML184 Dot Matrix ... 229
ML32Ø Dot Matrix ... 299
ML395C Dot Matrix ... 1,019
ML521 Dot Matrix ... 488
OL 83Ø+ Dot Metrix ... 1,079

Panasonic

KX-P443Ø SideWriter ... 689
KX-P2Ø23 Dot Metrix ... 195
KX-P2124 Dot Matrix ... 315
KX-P3624 Dot Matrix ... 409
KX-P44ØØ SideWriter ... 535
KX-P54ØØ SideWriter ... 835
KX-P2135 Dot Matrix ... 249
KX-P213Ø Dot Matrix ... 199

TEXAS INSTRUMENTS

MicroWriter LED 5ppm 512K ... $499
MicroWriter PS23 LED 5ppm 2MB ... 679
MicroWriter PS65 LED 5ppm 2MB ... 815
Microlaser Pro PS23 ... 1,349
Microlaser Pro PS65 ... 1,529
MicroMerc ... 239
MicroMarc color ... 379

TAPE BACKUPS

COLORADO MEMORY SYSTEMS

250MB COJUMBO25Ø ... $169
120MB COJUMBO ... 99
Trekker 250MB CØJT20 ... 329
Trakker 120MB CØJT1Ø ... 219

CONNER

TepeStor 250MB Internal A25Ø ... $149
TapeStor 250MB Ext. Per. A25ØEP ... 339

EXABYTE®

8mm 5.0Gig Model 85Ø5 ... $2,199
8mm 2 2Gig Model 82Ø5 ... 1,299
8mm Tape Certridge ... 12

IOMEGA

Iomega Tape250 Internal Basic ... $159
Iomega Tape250 Insider Half-height ... 179
Iomega Tape250 PC Powered Ext ... 269

Talon 250MB Internel

w/2 unformatted tapes TBTA25ØIK .. $179
w/5 formatted tapes TBTA25ØIK5 ... 229
Perallel Port w/ tape TBTAJT2Ø ... 319

WangDAT.

4mm DAT 2GB Int. 16 Bit Kit ... $899
4mm DAT 4GB 3200 Int 18 Bit Kit ... 1,049
4mm DAT 4GB 3200 Ext 16 Bit Kit ... 1,199
4mm DAT 8GB 3400 Int. 16 Bit Kit .. 1,299

HARD DRIVES

From the Mass Storage Experts

Caviar — HARD DRIVES International

Capacity	Interfaca	Model	Access	FF/Height	Bare	Kit
WESTERN DIGITAL						
210MB	IDE	WD121ØA	12ms	3 5" 1"H	199	$219
270MB	IDE	WD127ØA	12ms	3.5" 1"H	229	249
250MB	IDE	WD225ØA	12ms	3 5" 1"H	219	239
340MB	IDE	WD234ØA	12ms	3.5" 1"H	229	249
420MB	IDE	WD242ØA	12ms	3 5" 1"H	249	269
540MB	IDE	WD254ØA	12me	3.5" 1"H	329	349
730MB	IDE	WD27ØØA	12ms	3 5" 1"H	469	489
1080MB	IDE	WD31ØØØA	10ms	3 5" 1"H	659	679
CONNER						
213MB	IDE	CFS21ØA	14ms	3.5" 1"H	$209	$229
340MB	IDE	CFA34ØA	13ms	3.5" 1"H	259	279
340MB	SCSI	CFA34ØS	13ms	3.5" 1"H	329	429
426MB	IDE	CFS42ØA	14ms	3.5" 1"H	269	289
540MB	SCSI	CFA54ØS	10ms	3.5" 1"H	399	499
1060MB	SCSI	CFP1Ø6ØS	9.5ms	3.5" 1"H	749	769
FUJITSU						
1080MB	SCSI	FJ2694S	10ms	3 5" HH	$699	$799
Maxtor						
290MB	SCSI	MX7290S	15ms	3 5" 1"H	$289	389
340MB	IDE	MX7345A	12ms	3.5" HH	259	279
340MB	SCSI	MX7345S	12ms	3.5" HH	299	399
MICROPOLIS						
1050MB	SCSI	MC4110S	8 5ms	3 5" HH	$699	799
1050MB	SCSI	MC2210AV	10ms	3.5" HH	789	889
1626MB	IDE	MC2217A	10ms	3 5" HH	929	949
1690MB	SCSI	MC2217AV	10ms	3.6" HH	999	1,099
1750MB	SCSI	MC2217S	10ms	3.5" HH	929	1,029
2100MB	SCSI	MC1926	11ms	5.25" FH	1,399	1,499
3000MB	SCSI	MC1936	11ms	5 25" FH	1,999	2,099
3000MB	SCSI	MC1936AV	10ms	5.25" FH	2,069	2,169
9100MB	SCSI	MC1991	10ms	5.35" FH	4,059	4,159
Quantum						
170MB	IDE	OULPS17ØA	14ms	3.5" 1"H	$199	$219
170MB	SCSI	OULPS17ØS	14ms	3.5" 1"H	199	299
270MB	IDE	OULPS27ØA	12ms	3.5" 1"H	239	259
270MB	SCSI	OULPS27ØS	12ms	3 5" 1"H	269	369
340MB	IDE	OULPS34ØA	12ms	3.5" 1"H	279	299
340MB	SCSI	OULPS34ØS	12ms	3 5" 1"H	299	399
540MB	IDE	OULPS54ØA	12ms	3 5" 1"H	359	379
540MB	SCSI	OULPS54ØS	12ms	3 5" 1"H	399	499
1080MB	SCSI	OUEM1Ø8ØS	9ms	3 5" 1"H	739	839
1225MB	SCSI	OUPD1225S	10ms	3.5" HH	949	1,049
1800MB	SCSI	OUPD18ØØS	10ms	3.5" HH	939	1,039
2100MB	SCSI	QUEM21ØØS	9 5ms	3.5" HH	1,399	1,499
Seagate						
130MB	IDE	ST3145A	15ms	3.5" 1"H	$179	$199
210MB	IDE	ST3243A	14ms	3 5" 1"H	189	209
260MB	IDE	ST329ØA	16ms	3 5" 1"H	209	229
340MB	SCSI	ST339ØN	11ms	5.25" FH	329	429
340MB	IDE	ST3391A	12ms	3.5" 1"H	229	249
420MB	IDE	ST3491A	14ms	3 5" 1"H	249	289
452MB	IDE	ST355ØA	12ms	3.5" 1"H	299	319
452MB	SCSI	ST355ØN	12ms	3.5" 1"H	409	509
528MB	IDE	ST3655A	12ms	3.5" 1"H	329	349
540MB	SCSI	ST3655N	12ms	3.5" 1"H	399	449
545MB	IDE/SCSI	ST566OA/N	12ms	3.5" 1"H	349/419	369/519
1050MB	SCSI	ST312ØØN	9 5ma	3 5" 1"H	699	799
1700MB	SCSI	ST1195ON	8ms	3.5" 1"H	1,499	1,599
1700MB	SCSI	ST119ØØN	9ms	3.5" HH	1,049	1,149
2100MB	SCSI	ST124ØØN	10 5ms	3.5" HH	1,449	1,549
2145MB	SCSI	ST1255ØN	8ms	3 5" HH	1,599	1,699
2900MB	SCSI	ST434ØØN	11ms	5.25" FH	1,999	2 099
4294MB	SCSI	ST1515ØN	8ms	3.5" HH	2,399	2,499
9080MB	SCSI	ST41Ø8ØØN	11ms	5 25" FH	3,995	4,095

NOTEBOOK COMPUTERS

NEC

Ultralite Versa E 486 DX2 40 or 50MHz, 4MB RAM/Exp to 20MB, 2 type II PCMCIA, MS-DOS 6 2, Windows 3 1, built-in trackball
Color 120MB HD 40MHz ... 3,389
Color 250MB HD 40MHz ... 3,799
Color 209MB HD 50MHz ... 4,149
Color 340MB HD 50MHz ... 4,559
Color 340MB HD DX4/75 ... 4,939

TEXAS INSTRUMENTS

E-Series
200MB HD DX2/40 Color ... 2,099
200MB HD DX2/50 Color ... 2,349
200MB HD DX2/50 Active Color ... 2,849
340MB HD DX4/75 Active Color ... 3,549
455MB HD DX4/75 Active Color ... 4,435
M-Series Multimedia
120MB HD SX/25 Mono ... 1,839
120MB HD SX/25 Color ... 2,099
200MB HD SX/25 Active Color ... 2,929
340MB HD DX4/75 Active Color ... 4,899
Portable CD-ROM Docking Station ... 779

TOSHIBA

Ti1910
486SX-33MHz, 4MB RAM/Exp. to 20MB PCMCIA Slot
200MB Monochrome ... $1,489
200MB Color Dual Scan ... 2,039
T1960
486DX2-50MHz, 4MB RAM/Exp to 20MB PCMCIA Slot
200MB, Color Duel Scan ... $2,389
200MB, Color, Active ... 2,999
320MB, Color, Active ... 3,289
T3400 Portage
120MB Active Color ... $3,349
120MB Monochrome ... 1,699
T4700
200MB Color Duel Scan ... 3,159
320MB Dual Color Scan ... 3,399
320MB Active Color ... 4,799
200MB Active Color ... 4,579

"SIMPLY THE LOWEST PRICES"

20,000 PRDUCTS, 24 HOURS A DAY

FREE Insight Catalog.

The Insight catalog is your Super Direct™ source for computers, hardware and software.

Insight®

Your Direct Source

800-927-3159

National Accounts - 800-927-2907
Corporate Fax - 602-902-1191
Government Fax - 602-902-1126
Educational Fax - 602-902-1177

Circle 103 on reader service card.

Prices and avail subject to changes w/o notice. Worry-Free Guarantee and 1-year warranty may have restrictions. Shipping is not refundable. All trademarks are the properties of their respective owners. Typographic errors are subject to correction. Photos may not represent actual product. The following products are subject to a 15% restocking fee when returned to Insight Direct, Inc. for a refund: non-Insight computers, notebooks and printers. All warranties will be handled by the manufacturer on above products. Manufacturer warranty after 30 days. Software will not be accepted for a refund when the shrink wrap is broken. © Insight Direct, Inc. 8/94

Zenith Data Systems

-NOTEFLEX Multimedia Notebook

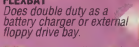
$4719

e -NOTEFLEX family from Zenith Data
ems is an exciting new class of notebook PC
c unites leading edge modular design with
erful computing, communications and multi-
dia capabilities. If you are looking for a perfor-
nce system, look at the Z-NOTEFLEX.

- 486SX/33, 486DX2/50 or DX4/75 processor
- User upgradable processor, memory, hard
  ve, display and more
- B RAM exp. to 24MB
- 240/450/520MB removable hard drive
- ice of 10.4" monochrome, 10.3" dual
  n color or 9.5" active matrix color display
- bit VL local bus video
- ttachable video display
- uilt-in 16-bit stereo sound with speaker
  nd microphone
- grated trackball
- o Type II or one Type III PCMCIA slot
- S-DOS, Windows for Workgroups
- year warranty

essor	Screen	Hard Drive	Price
33	10.4" monochrome	200MB	$2449
X2/50	10.3" dual scan	200MB	$3649
X2/50	9.5" active matrix	340MB	$4719
2/50	9.5" active matrix	450MB	$5069
DX4/75	9.5" active matrix	520MB	$5339

Port Replicator
Optional PCMCIA and Ethernet connectors available



FLEXBAY
Does double duty as a battery charger or external floppy drive bay.

FLEXSITE LCD Display Stand
Extend your viewing options up to 3 feet on your desk.

ZENITH DATA SYSTEMS

-NOTEFLEX ACCESSORIES

EXDOCK port replicator	$219.99
EXBAY floppy bay/battery recharger	$159.99
EXSHOW Multimedia Companion	$799.99
EXSITE LCD Display Stand	$199.99

Hewlett Packard Power

aserJet 4L

- 4PPM
- Crisp, 300dpi print-quality
- Resolution Enhancement Technology
- 1-year warranty

aserJet 4L	$659.99

LaserJet 4L

aserJet 4P

- 4PPM
- Sharp, 600dpi print-quality
- 2MB RAM w/Memory Enhancement Technology
- 1-year warranty

aserJet 4P	$959.99

DeskJet/DeskWriter 310

- High quality 3 PPM printing
- Low cost optional color kit
- 1-Year warranty

DeskJet 310	$299.99
DeskWriter 310	$299.99

DeskJet/DeskWriter 520

- Sharp, 600 x 300 dpi "laser-like" print quality
- Resolution Enhancement Technology for smooth, crisp text and graphics
- 3-Year warranty

DeskJet 520	$289.99
DeskWriter 520	$289.99

eskJet 500C

- Letter-quality 300dpi color printing
- 100 Sheet feeder for versatile paper handling
- 3-year warranty

eskJet 500C	$389.99

DeskJet 310

DeskJet/DeskWriter 560C

- Color 600 x 300 dpi "laser-like" print quality
- Resolution Enhancement Technology for smooth, crisp text and graphics
- 3-Year warranty

DeskJet 560C	$569.99
DeskWriter 560C	$569.99

HEWLETT PACKARD
uthorized Dealer

Cs Compleat. All prices subject to change and do not include shipping. Monitors sold separately. Lease prices reflect 36 month operating lease to approved business cus-
ers. All products or brand names are trademarks of their respective companies. PCs Compleat, 34 St. Martin Drive, Marlborough, MA 01752. Phone (508) 480-8500. Not
sponsible for typographical errors.

Before You Buy

TI IBM AST NEC COMPAQ TOSHIBA

Shop and Compare

Don't Settle for Less

	PCs Compleat	Supplier 2	Supplier 3
Guaranteed Lowest Price	YES		
The Best Brand Names	YES		
30-day Money Back Guarantee	YES		
Never a Restocking Fee	YES		
30-day Price Protection	YES		
PC Computing Five Star Award	YES		
Lifetime *Toll-Free* Technical Support	YES		
FREE Hardware Configuration	YES		
FREE Software Installation	YES		
Same Day Shipment	YES		
Pre-installed Software Discount	YES		
All Major Credit Cards Accepted	YES		
Never a Hidden Surcharge	YES		
$4.95 Shipping on Most Peripherals	YES		
Compaq Authorized for Direct Marketing	YES		
90 Days Same As Cash	YES		
Low Cost Business Leases	YES		
Volume Purchase Agreements	YES		
FREE Asset Tagging	YES		
Customer Satisfaction Is Top Priority	YES		

PC Computing
INSIDE OF PAGE 1
FIVE STAR AWARD

PCs Compleat is the proud recipient of PC/Computing magazine's highest Five Star rating for service and overall performance in its listing of the nation's leading direct sellers.

PCs COMPLEAT
THE BEST · BRANDS · PRICE · DELIVERY · SERVICE

Open 24 Hours
Six Days
Weekends & Holidays
8 AM to 5 P.M. E.T.

CALL TODAY!
800-598-4727
International (508) 624-6400

Toshiba Direct

T3400

- ▲ Ultra-portability at only 4 lbs
- ▲ 486SX/33 processor
- ▲ 120MB hard drive
- ▲ 4MB RAM, expandable to 20MB
- ▲ PCMCIA Type II slot
- ▲ External 3.5" disk drive
- ▲ Integrated AccuPoint pointing device

Processor	Screen	Hard Drive	Price
486SX/33	Monochrome	120MB	$1699*
486SX/33	Active Color	120MB	$2779
486SX/33	Active Color	250MB	$3389
486DX2/50	Active Color	250MB	$4069

Lease for $62/mo.

T4800

$5599*

T4700 and T4800

- ▲ 8MB RAM, expandable to 24MB
- ▲ Brilliant 9.5" display with local bus video
- ▲ 2 PCMCIA slots (Type II, Type III)
- ▲ Microsoft Sound System, built-in microphone, audio out port
- ▲ MS-DOS, UltraFont, Indeo video compression software, Windows for Workgroups 3.11

Model	Processor	Screen	Hard Drive	Price
T4700	486DX2/50	Dual scan color	200MB	$3127
T4700	486DX2/50	Dual scan color	320MB	$3337
T4700	486DX2/50	Active color	200MB	$4549
T4700	486DX2/50	Active color	320MB	$4699
T4800	486DX4/75	Active color	500MB	$5599

Lease for $114/mo.

T2400

- ▲ 486DX2/50 processor
- ▲ 2 PCMCIA slots (Type II, Type III)
- ▲ Integrated AccuPoint pointing device
- ▲ Optional sound card
- ▲ MS-DOS, Windows for Workgroups

Screen	Hard Drive	Price
Dual Scan Color	250MB	$2929*
Active Color	250MB	$3639
Active Color	320MB	$3799

Lease for $107/mo.

T2400

$2929*

Satellite Notebooks

- ▲ 4MB RAM, expandable to 20MB
- ▲ 9.5" display
- ▲ Type III PCMCIA slot
- ▲ 82-key keyboard
- ▲ MS-DOS, Windows 3.1
- ▲ Ballpoint mouse with Quickport
- ▲ Enhanced power management

Model	Processor	Screen	Hard Drive	Price
T1910	486SX/33	Monochrome	200MB	$1439
T1910	486SX/33	Dual scan color	200MB	$2039
T1950	486DX2/40	Dual scan color	200MB	$2289
T1950	486DX2/40	Active color	200MB	$2929
T1950	486DX2/40	Active color	320MB	$3199
T1960	486DX2/50	Dual scan color	200MB	$2379*
T1960	486DX2/50	Active color	200MB	$3029
T1960	486DX2/50	Active color	320MB	$3259

Lease for $55/mo

TOSHIBA

Compaq Compleat

Call About New LTE Elite

ProLinea Desktops

- ▲ 4MB RAM expandable to 100MB
- ▲ Pentium upgradable
- ▲ 3.5" floppy drive
- ▲ Local bus graphics
- ▲ MS DOS 6.0, Windows 3.1

Processor	RAM	Hard Drive	Price*
486SX/33	4MB	200MB	$1099
486DX2/50	4MB	200MB	$1249
486DX2/66	4MB	340MB	$1829
486DX2/66	4MB	525MB	$1969
486DX4/100	8MB	340MB	$2299
486DX4/100	8MB	525MB	$2469

*Compaq color monitors start at $259.99

Prolinea Net1 Models Available Call For Pricing

Prolinea $1099

Concerto $1229

Contura 4/25

- ▲ 486SL/25 processor
- ▲ 4MB RAM expandable to 20MB
- ▲ 200MB hard drive
- ▲ Available with monochrome, dual scan color or active matrix color display
- ▲ MS-DOS 6.0, Windows 3.1, trackball

Screen	Price
Monochrome	$1899
Dual scan Color	$2319
Active matrix color	$2799

Lease for $73/mo.

Contura Aero

- ▲ Type II PCMCIA slot
- ▲ Integrated trackball
- ▲ Weighs only 3.5 lbs.(mono), 4.31 lbs. (color)
- ▲ MS-DOS 6.0, Windows 3.1

Processor	Display	Hard Drive	Price
486SX/25	Monochrome	84MB	$999*
486SX/25	Monochrome	170MB	$1419
486SX/33	Passive Color	170MB	$1989
486SX/33	Passive Color	250MB	$2269

Lease for $50/mo.

Concerto

- ▲ 4MB RAM expandable to 20MB
- ▲ 9.5" mono display
- ▲ 2 TYPE II or 1 Type III PCMCIA slots
- ▲ Untethered intelligent pen
- ▲ MS-DOS 6.0, Windows 3.1, InkWare NoteTaker,

Processor	RAM	Hard Drive	Price
486SL/25	4MB	120MB	$1229
486SL/25	4MB	250MB	$1769
486SL/33	4MB	250MB	$1299

Lease for $50/mo.

PCs COMPLEAT

THE BEST: BRANDS · PRICE · DELIVERY · SERVICE

Open 24 Hours Weekdays

Weekend & Holidays 8 A.M. to 5 P.M. E.T.

CALL TODAY!

800-598-4727

International (508) 624-6400

COMPAQ

IBM® · IBM® · IBM®

ThinkPad 500
170MB 1999
Full-motion Lux

uePoint SpaceSaver Si

- B RAM exp. to 64MB
- A Local Bus graphics
- 2KB Video RAM exp. to 1MB
- expansion slots, 3 drive bays
- M DOS 6.1/MS Windows 3.1, mouse,
- hanced 101 keyboard

ssor	Hard Drive	Price
/25	120MB	$929
/33	212MB	$1249
/2/66	212MB	$1639

lor priced separately

uePoint Performance

- eyond the very edge of industry standards with the
- luePoint Performance Series, featuring:
- 86DX/33, DX2/66, or DX4/100
- ocessor, Pentium upgradable
- 8MB RAM exp. to 128MB
- -bit VESA Local Bus Graphics
- lectaBus VESA or PCI Bus technology
- (interchangeable)
- upport for up to 4 IDE devices
- M DOS 6.3, MS Windows 3.11
- Year Warranty

Call for models and prices!

ValuePoint Performance

$1939*

ThinkPad 360

CALL

ThinkPad 360 notebooks

- ▲ 486SL/33 processor
- ▲ 4MB RAM exp. to 20MB
- ▲ Modular design, removable hard drive & floppy drive
- ▲ Local Bus Graphics with 1MB video RAM
- ▲ 2 Type II or 1 Type III PCMCIA slot
- ▲ TrackPoint II integrated pointing device
- ▲ IBM DOS 6.3, Windows 3.1, Lotus cc:Mail, Organizer, ScreenCam, Official Airline Guide FlightDisk, CoSessions Host, Prodigy, America Online, and FaxWorks 3.0
- ▲ Port Replicator and Docking Station available

Screen	Hard Drive	Price
Monochrome	170MB	$1939*
Monochrome	340MB	$2419
Dual Scan	170MB	$2519
Dual Scan	340MB	$2999
Active Color	170MB	$3389
Active Color	340MB	$3869

Pen models also available

ThinkPad® 510 subnotebook

- ▲ IBM 486BL2/50 processor
- ▲ 4MB RAM exp. to 20MB
- ▲ 200MB hard drive
- ▲ 7.7" dual scan color
- ▲ Type II PCMCIA slot
- ▲ TrackPoint II integrated pointing device
- ▲ 3.5" external floppy drive
- ▲ Weighs only 3.8 lbs. (w/battery)
- ▲ IBM DOS 6.3, Windows 3.1, Lotus cc:Mail, Organizer, ScreenCam, Official Airline Guide FlightDisk, CoSessions Host, Prodigy, America Online, and FaxWorks 3.0

$2319*

NEC: Versatility

UltraLite Versa S

- A 486 processor
- A 9.5" screen
- A 2 Type II PCMCIA slots
- A Only 4.2lbs. (mono)

ocessor	Screen	Hard drive	Price
SSX/33	Mono	210MB	$1889*
SSX/33	Dual scan	210MB	$2319
SX/33	Active color	210MB	$3219
DX2/50	Active color	260MB	$3689

Lease for $69/mo.

Versa S $1889*

UltraLite Versa E

- ▲ 486 processor
- ▲ 4MB RAM, expandable to 20MB
- ▲ 2 Type II PCMCIA slots
- ▲ MS-DOS 6.2, Windows 3.1, built-in trackball
- ▲ Removable hard drive
- ▲ Removable screen
- ▲ Pen upgradable

Processor	Screen	Hard drive	Price
DX2/40	Active color	120MB	$3439*
DX2/40	Active color	250MB	$3849
DX2/50	Active color	209MB	$4199
DX2/50	Active color	340MB	$4599
DX4/75	Active color	340MB	$4999
DX4/75	Active color	500MB	$5249

Versa E $3439*

MultiSync Monitors

- 15" SVGA
- 1024x768, .28mm NI
- 7MHz VESA refresh
- MPR II, EnergyStar

$469.99

2V-14" SVGA-$339.99
5FGp-17" SVGA-$1109.99
6FGp-21" SVGA-$2019.99

NEC

Circle 147 on reader service card.

PCs COMPLEAT

THE BEST · BRANDS · PRICE · DELIVERY · SERVICE

Open 24 Hours
Weekdays
Weekends & Holidays
8 A.M. to 8 P.M. EST.

CALL TODAY!
800-598-4727
International (508) 624-6400

Your PC DISCOUNT Catalog Superstore

BRAND NAMES.

The PC Zone™

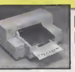
WHERE AMERICA'S BUSINESSES SHOP
1•800•252•0386

SupraExpress 14.4i Internal FAXModem for Windows

◆ 14,400 send/receive data/fax modem **$79**

The SupraExpress 14.4i Internal FaxModem is a 1/2 card for Windows users on IBM PC & compatible computers and comes with everything you need to get started: fax software, cables, manuals, and a free subscription to on-line services. It offers a complete data/fax solution and carries a five-year manufacturer's limited warranty. Supra *W#15748*

HP DeskJet 560C Inkjet Color Printer **$589**



◆ 600x300 dpi with HP's Resolution Enhancement Technology

The HP DeskJet 560C Inkjet Printer provides advanced color printing through ColorSmart technology and 600x300 dpi resolution. It prints on plain, special or glossy paper, transparencies and envelopes. And comes with a 3-year warranty for affordable, high-quality printing for years to come. Hewlett-Packard *#13686*

D09944	Abracadata Design Your Own Railroad	$32.98
	Adobe	
813024	Acrobat Personal Distiller	$449 98
813021	Acrobat Starter Kit	$658 98
W10791	Illustrator 4.0 w/Streamline 3.0	$429 98
W17200	Photoshop 2 5 1 Win, KTP Photodisc	$549 98
W13033	Photoshop 2 5/Illustrator/8	$599 98
	Aldus	
W07215	Aldus FreeHand 3 11 Win	$360 98
W17248	Aldus FreeHand 3.11 Win V/U	$139 98
W09058	Aldus PageMaker 5 0 Win	$559 98
W13204	PageMaker 5 0 Single user Lic Pk	$438 98
W12562	Aldus PageMaker 5 0 V/U	$139 98
W17240	TouchBase 1 0 Win/Quicken 3 0	$44 98
W13495	Allegro Clinton Health Security Plan	$12 98
B97164	Amer. S/W Phone Disc USA Biz	$48 98
	American Training	
W13927	Barbie PC Fashion Design & Color	$18 98
W13928	Creature Maker	$18 98
W14109	Teach Me Excel 4 0 Win/Word Win	$26 98
W14112	Teach Me Lotus 1-2-3 v. 3 4	$26 98
W14108	Teach Me MSDOS 6/Win 3.1/PC386-486	$24 98
W14113	Teach Me Win 3.1	$24 98
W14114	Teach Me WordPerfect 5.2 Win	$24 98
814848	The Computer Carnival	$24 98
W13929	The Great Computer Adventure	$24 98
W13201	Arabesque ECCO Pro 2 0	$179 98
W13245	Arabesque ECCO Simplicity 2 0	$68 98
W14425	Ares FontChameleon and FontMinder/8	$184 98
W14419	Autodesk AutoCAD LT Win	$448 98
D07617	Autodesk Generic CADD 6.1	$288 98
W11335	Avantos ManagePro 2 0 Win	$229 98
	BERKELEY SYSTEMS	
W07787	After Dark 2.0 Win	$27 98
W13701	The Disney Collection Scr. Svr	$27.98
	Borland	
W07326	Borland C++ 4.0	$336 98
W13991	Borland C++ 4 0 CD-ROM Spec /U	$186 98
W11507	Borland C++ 4 0 Special/U	$186 98
W13989	Borland Visual Solutions Pk	$92 98
D12414	dBASE 5 0 DOS	$514 98
D12400	dBASE 5 0 DOS V/U	$144 98
W15787	dBASE Win	$329 98
W15794	dBASE Win V/U	$189 98
W11872	Paradox 4.5 Win	$138 98
	Caere	
W12309	OmniPage Direct Win 2 0	$98.98
W09785	OmniPage Pro 5 0 Win	$498 98
	Claris	

Lotus 123 Release 5

W12397 **$94**

New Version!

W13575	Claris Works Win w/Fax Works	$58 98
W11328	Filemaker Pro 2 1 Win	$114 98
W11722	FileMaker Pro 2 1 Trade Up	$88 98
	Corel	
W15695	Corel CD PowerPak	$34 98
W16032	Corel GALLERY	$34 98
W15650	Corel VENTURA 4 2 Win CD-ROM	$134 98
W16009	CorelDRAW 3 CD	$99 98
W17212	CorelDRAW 3 to 5/U CD & Disk	$418 98
W17211	CorelDRAW 3 to 5/U CD only	$324 98
W12556	CorelDRAW 4 Win	$388 98
W12581	CorelDRAW 4 Win V/U	$228 98
W13211	CorelDRAW 4 Win V/U CD only	$139 98
W17210	CorelDRAW 4 to 5/U CD & Disk	$229 98
W17209	CorelDRAW 4 to 5/U CD & Wacom ArtZ	$464 98
W16038	CorelDRAW 4 to 5/U CD only	$178 98
W16037	CorelDRAW 5 CD-ROM Only	$469 98
W12593	CorelSCSI 2 DOS, Win, and OS/2	$89 98

D09149	Datastorm Procomm Plus 2 01	$69 98
W11145	Datastorm ProComm Plus Win	$94 98
W13704	Dataviz Conversions Plus Win	$92 98
W09577	Delrina WinFax Pro 4 0	$89 98
W12898	DesignCAD 2D Win 7 0	$174 98
B97165	Digital Dir Phone Disc Residential	$48 98
897166	Digital Dir. Phone Disc Reverse	$148 98
W13926	Elseware Font Works	$79 98
W13941	Fauve Matisse 1 25	$98 98
W14492	Firefly PhotoGenix Pro Ed	$129 98
W07475	Fractal Design Painter 2.0 Win	$258 98
W11188	FrameMaker 4 Win	$579 98

Microsoft Office 4.2

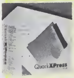
W12153 **$265**

Competitive & Version Upgrade!

W15655	HSC Kai's Power Tools 2 0 Win	$114 98
805438	Hyperglot Berlitz Think & Talk French CD-ROM	$122 98
805439	Hyperglot Berlitz Think & Talk Spanish CD-ROM	$122 98
	IBM	
W14753	OS/2 2.1 Win	$45 98
W14754	OS/2 2.1 Win CD Ver.	$35 98
W13955	IdeaFisher Win	$94 98
W15967	Imageware ImageWizard	$89 98
W15968	Imageware Morph Wizard	$69 98
W13917	IMSI The Art of Business	$144 98
W07857	Inset HiJaak Pro Win 2 0	$79 98
W14763	Iterated Images Inc. III	$98 98
W14785	Iterated Images Inc w/Fractal Vid Clip	$139 98
D09446	Jian Biz Plan Builder	$78 98
W14277	Leister Reunion - The FamilyTree Win	$94 98
	Lotus.	
W13366	CC Mail 10 User Pk 4 0	$225 00
D09854	CC Mail DOS Platform Pk 4 0	$190 00
W12499	CC Mail Win Plat Pk Quick Ref Set	$98 98
W09853	CC Mail Win Platform Pk 2 0	$324 00
W15303	CC.Mail Grp Pk DOSWIN 10-User 2 0	$569 98
D07203	CC.Mail Remote 3 3 1 (DOS)	$149 98
W07430	FreeLance 2 01 Win V/Comp/U	$94 98
W07164	FreeLance Win 2 01	$330 98
D09581	FreeLance Graph 4 0 20133	$328 98
W16657	Improv 2 1 License Pk	$85 98
W16656	Improv Win 2 1	$95 98
D07885	Lotus 123 2 4 DOS	$332 98
D11059	Lotus 123 2.4/U	$98 98
D11988	Lotus 123 2 4/U Lic Pk	$84 98
D09582	Lotus 123 3.4a	$395 98
D07149	Lotus 123 3.4A/U 090627	$93 98
D07148	Lotus 123 3 4A/U 090637	$93 98
W09668	Lotus 123 Win 1 1 012652	$308 98
W11342	Lotus 123 Win 1.1 Server	$365 98
W12397	Lotus 123 Rel 4 01 Win V/Comp/U	$94 98
W12395	Lotus 123 Rel 4 01 Win	$292 98
W12497	Lotus 123 Rel 4 Win Lic Pk	$245 98
W11998	Lotus Ami Pro 3 0/U Lic	$58 00
W09557	Lotus Ami Pro 3 01 Win	$240 98
W15332	Lotus Ami Pro R3.01 Comp/U	$94 98
W13570	Lotus Approach 2 1 Win	$94 98
D09894	Lotus FreeLance 4 Comp/U 90523	$98 98
W13564	Lotus Improv 2.1	$310 98
W13772	Lotus Notes 3 0 Server	$409 98
D13583	Lotus Notes OS/2 Client	$408 98
W13581	Lotus Notes Win Client 3.0	$408 98
W11193	Lotus Organizer Win 1 1	$94 98
W12406	SmartSuite 2 1	$448 98
W13869	SmartSuite 2 1 Doc Pk	$103 98
W12408	SmartSuite 2 1 V/Comp/U	$280 00
	Macromedia	
W12866	Director 3.1 Player Win	$718 98
W99514	Dir 3 1 3 w/Dir 3.1 Player Win	$1,248 00
W15786	Meca Managing Your Money Win 1 0	$34.98

W14434	Publisher's Paradise Pro CD-ROM	$34 98
	Micrografx	
W14443	ABC Flowcharter Win 3.0	$298 98
W13793	Designer 4 0	$458 98
W14841	Microhelp UnInstaller 2	$38 98
	Microsoft	
W11642	WFW 3 11 (Win for Wrkgrp)	$131 98
W11645	WFW 3 11 Add-on Win 3 1 User	$42 98
W11770	WFW 3 11 Intro to Networking	$29 98
W11643	WFW 3.11 MLP Lic Pk	$118 98
D12225	DOS 6 21/U	$44 98
D12226	DOS 6 21/U	$44 98
D12150	DOS 6 21/U 3Pk	$113 98
D13882	DOS 6.21/U Step-Up	$9 98
W15406	Excel 5.0 Win Comp/U	$114 98
W07893	Excel 5.0 Win V/U	$88 98
W07975	Excel 5.0 Win	$298 98
W11888	FoxPro 2 6 Std Ed	$88 98
W12413	FoxPro Win & DOS2 5-2.6 Dist Kit	$18 98
W12093	FoxPro Win 2 5 to 2 6/U	$18 98
D16370	FoxPro 2 6 DOS Lic Pk	$79 98
D12091	FoxPro 2 6 DOS	$88 98
D16368	FoxPro 2 6 Pro DOS	$442 98
W16366	FoxPro 2 6 Pro Win	$442 98
W16367	FoxPro 2 6 Pro Win/U/any	$268 98
D16369	FoxPro 2 6 Pro V/U DOS	$278 98
D12096	FoxPro V/U from 2 5 to 2 6 DOS	$18 98
W13552	Office 4 2 Win Pro	$559 98
W16352	Office 4 2 Win/U on CD ROM	$265 98
W12153	Office 4 2 Win V/Comp/U	$265 98
W10564	Office 4 2 Win	$494 98
W13060	Office 4 2 Win CD ROM	$454 98
W11174	Office 4 3 Pro MLP 1 User	$459 98
W17833	Office 4 3 Pro MLP/U 1 User	$333 98
W17831	Office 4 3 Pro V/Comp/U	$355 98
W13553	Office 4 3 Pro CD ROM	$539 98
W13552	Office 4 3 Pro Win	$539 98
W17847	Office Assistant Win	$64 98
W07209	PowerPoint 4 0 Win V/Comp/U	$114 98
W11213	PowerPoint 4 0 Win	$298 98
D17743	Project 4 0 DOS	$297 98
W12157	Project 4.0 Win	$418 98
W07947	Project 4 0 V/U Win	$134 98
W11647	WFW 3.11 Add-on Win 3 1 Sngl M	$36 98
W15405	WFW 3.11 Add-on Win 3.11 20 MM	$672 98
W07752	Win 3 11	$88 98
D08942	Word 6 0 DOS	$314 98
W13888	Word 6 0 Win V/U	$88 98
W09974	Word 6 0 Win	$298 98
W07404	Word 6 0 Win Comp/U	$108 98

Quark QuarkXPress 3.3



W11910 **$568**

W11036	Midisoft Studio 3 1 Win	$158 98
W96919	Miramar Personal MacLan Connct	$124 98
W14293	Music Ware Piano!	$89 98
	NOVELL.	
816058	NetWare 3.12 10 user 3 5	$1,580 00
816065	NetWare 3 12 100 user CD	$4,430 00
B16060	NetWare 3 12 25 user 3 5	$2,340 00
	Peachtree	
W11078	Peachtree Acctg Win 3 0	$114 98
D11327	Peachtree Complete Acctg 7.0	$179 98
D15976	Photodex Picture Factory Set 1	$38 98
W99551	Pixar OneTwentyEightVol 1	$178 98
W11740	Pixar Typestry Win 1.1	$184 98
807980	Presentation Task Force 4 0	$88 98
W14149	Pro CD Select Phone	$179 98
W11910	QuarkXPress 3.3 Win	$568 98
W09768	Quicken Win 3 0	$39 98
D09707	Renaissance QEMM 386 7.03	$59 98
896514	Sense Interactive America	$39 98

W14846	Sense Interactive Earth Air Fire Water	$49 98
W11509	Shapeware Visio 2 0 Win	$123 98
	Softkey	
W10777	Amer Heritage Dictionary III	$39 98
895594	Amer Heritage Talking Dictionary CD	$39 98
W11919	Calendar Creator Plus 2 0 Win	$44 98
W15055	Land Designer Win	$44 98
W15054	myHouse Win	$44 98
B94301	Sports Illus Sports Almanac CD Win	$39 98
W07480	SPC Harvard Graphics 2 0 Win	$278 98
W09851	Stac Electronics Stacker 4 0 Win/DOS	$94 98
	Stagesoft	
D14787	Acctg For Sm Biz LAN Std P	$279 98
D14762	Acctg For Sm Biz Bonus Pk	$136 98
D14786	Acctg For Sm Biz LAN Bonus Pk	$349 98
D14758	Acctg For Sm Biz Std Pk	$98 98
	SYMANTEC.	
W10923	ACT! 2.0 Win	$164 98
W07153	Norton AntiVirus 3 0 DOS/Win	$78 98
W07834	Norton DeskTop 3 0 Win	$99 98
W10718	Norton DeskTop 3 0/U Win	$46 98
W07380	Norton Utilities 8 0	$99 98
W07800	Norton Utilities 8 0/U	$48 98
W12551	pcANYWHERE 1 0 Win	$122 98
D07653	pcANYWHERE 4 5 Host/Remote	$118 98

Symantec Norton Utilities 8.0

W07380 **$99**

New Version!

	T/Maker	
W12895	Incredible Image Pak CD ROM	$64 98
814423	Studio Series Design Group CD	$188 98
D14292	Write Pro 1/2/3/4	$59 98
B11902	Three-G Images w/Impact! CD ROM	$278 98
W13273	Timeslips 5 Win	$194 98
W12214	Traveling S/W LapLink V (Win/DOS)	$99 98
W12888	Virtus WalkThrough 1 1	$118 98
W12878	Voudette Flowerscape	$44 98
	WordPerfect CORPORATION	
W12392	Borland Office 2 0 Win	$360 98
W15079	Borland Office 2 0 V/U	$222 98
W12391	Borland Office Win 2 0 Comp/U	$274 98
D12383	WP 6.0 DOS	$274 98
W09740	WP 6 0A Win	$205 98
W13860	WP 6 0A V/Comp/U Win	$74 98
D12158	WP Presentation 2 0 Comp/U	$98 98
D11127	WP Works Addl Lic Pk	$58 98
W13877	WP 6 0 Comp Trade up Win CD-ROM	$128 98
D16179	WP 6 0 Dos Documentation	$31 99
D12386	WP 6 0 DOS V/U	$98 98
W13876	WP 6 0 Win/U CD-Rom	$94 98
W13872	WP 6.0A Win CD ROM	$312 98
W13894	WP 6 0A Win & Quattro Pro 5.0/B	$292 98
W13896	WP 6 0A Win & Quattro Pro 5 0 V/U	$129 98
W13895	WP 6 0A Win & Quattro Pro Comp/U	$128 98
W13872	WP 6 0A Win CD ROM	$312 98
W10697	WP 6 0A Win Lic Pk w/Docs w/out Media	$211 98
W13876	WP 6 0A Win V/U CD ROM	$94 98
W13373	WP Presnt 2 0 Win Lic Pk w/DOCS	$298 98
W13375	WP Presnt 2 0 for Wn Single/U	$78 98
W13374	WP Presnt 2 0 Win Lic Pk w/oDOC	$172 98
D15496	WP Works 1 0	$69 98

COMPATIBILITY KEY

W=Windows *D=DOS* *B=Both*

UPGRADE KEY

B = Bundle
U = Upgrade
V/U = Version Upgrade
Comp/U = Competitive Upgrade
V/Comp/U = Version Competitive Upgrade

Knowledgeable Sales Advisors help make buying easy!

Credit cards are not charged until the order is shipped Most products ship the same day for overnight delivery Packages shipped overnight at $6 for the first 7 pounds and $1 for each additional pound or UPS at carrier's actual rate Call for international shipping rates Packaging and handling $4 per order. Returns subject to a restocking fee Prices and product availability subject to change without notice Specials and promotions may be limited to stock on hand

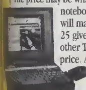
IF YOU DON'T SEE IT...CALL!

© 1994 Copyright Multiple Zones International Inc. All rights reserved. Unauthorized duplication is violation of applicable laws. Windows™ is a registered trademark of Microsoft Corp

DISCOUNT PRICES.

TravelMate 4000E SX/25 Color $1699

- 486SX 25MHz processor
- 4MB RAM, 120MB hard disk drive



The price may be what makes you buy this crisp color notebook, but once it's yours, the quality will make you glad you did. The 4000E SX/25 gives you the technological integrity of other TravelMates with a budget-conscious price. At 6 lbs. and 8.5"x11"x2.1", it's easy to handle for on-the-go professionals. Texas Instruments ***#12628***

Win $3,000 of FREE hardware, software & accessories from this ad!

The PC Zone™

How To Enter: Just place an order and you are automatically entered in our contest.

No purchase necessary All entries must be received by 11/30/94 You may also enter simply by call us toll-free at the number below or by mailing a standard 3"x5" note card to $3,000 00 Shopping Spree Sweepstakes 15815 SE 37th Street – Suite B Bellevue WA 98006 Please include the following information • Your full name • Your work or home address and phone number • The name of your company • The name of the magazine advertising this sweepstakes Official Rules You must be at least 21 years of age to enter Offer void where prohibited by law Entries must include the name of the magazine advertising this sweepstakes Offer valid in the U S only One entry per person Other restrictions may apply Prize package awarded by random drawing on 12/29/94 To obtain complete contest rules and the name of the winner send a written request with a self-addressed stamped envelope to $3 000 00 Shopping Spree Sweepstakes, Winner Information Request 15815 - SE 37th Street Suite B, Bellevue, WA 98006

What would you buy with your $3,000?

Your PC DISCOUNT Catalog Superstore

Network Products

3Com

13787	3C509 Etherlink III Coax	$115 98
13784	3C509 Etherlink III 108T	$115 98
13786	3C579 Etherlink EISA Coax	$229 98
18341	3C509 Etherlink III Combo-5 pk	$578.98
14189	3C1627 12 Port Linkbuilder 10BT	$668 98

Artisoft

14566	Simply LANtastic V1 0	$55.98
14156	NodeRunner/SI 2000A	$105.98
12608	NodeRunner 2000T	$174 98
18803	LANtastic V6.0 5 User	$322 98
12605	NodeRunner Starter Kit Windows	$499 98
14186	T-Runner 12 Port 10BT	$488 98

Coactive

18300	Coactive Starter Kit	$189 98
18301	Coactive Add On Kit	$139.98

GVC

18988	GVC MAU-BNC Ethernet Transceiver	$30.98
18981	GVC NIC-2000T Ethernet 108T	$50.98
18982	GVC NIC 20008T Ethernet COAX/10BT	$54 98
18984	GVC NIC-32E8M 32BIT Ethernet COM80	$245 98

intel

18353	EtherExpress 16 Coax	$99 98
18357	EtherExpress 16 10BT	$99 98
18369	NETPORT II COAX	$36B 98
18370	NETPDRT II 10BT	$36B 98
18371	EtherExpress ISA HUB	$519 98
18367	EtherExpress Flash Combo 5PK	$599 9B
18359	EtherExpress 16 10BT 20PK	$1,698 00
18363	EtherExpress 18 COMBO 20PK	$2,036 00

NOVELL.

15362	Personal Netware 1 0-1 User	$6B 9B
15364	Pers Netware Info Mover Bundle	$268 98
11345	Netware 3 12-5 User	$734 9B
99430	Netware 4 01-5 User	$799 98
16059	Netware 3 12-10 User	$1,580 00
15807	Netware 4 01-10 User	$2,42B 00
16061	Netware 3 12-25 User	$2,340 00
99428	Netware 4 01-25 User	$2,897 00
16063	Netware 3.12-50 User	$3,100 00
13771	Netware 4.01-50 User	$3,885.00

SMC

18336	PC130 Arcnet Coax	$6B 9B
14556	Ultra 16 Ethernet Coax	$105 9B
14553	Ultra 16 Ethernet 10BT	$105 9B
14550	Ultra 16 Ethernet Combo	$119 98
18329	Ethercard+ Elite MCA 10BT	$189 98
18335	PC600FS Arcnet Card Coax	$199 98
14561	3608 Ethernet 8 Port Con 10BT	$329 98

Xircom

18351	Xircom 14.4 Pocket Modem Coax	$447.98
18352	Xircom 14.4 Pocket Modem 10BT	$447.98
18349	Pocket Token Ring III	$455 98

Tape, Removable & Floppy Drives

COLORADO MEMORY SYSTEMS INC.

09823	Jumbo 250MB Internal	$167.98
12034	Trakker 120MB Parallel PDRT	$199 98
12035	Trakker 250MB Parallel PORT	$324.98
18373	Power Tape 2.4GB SCSI External	$1,087.00
18374	POWEROAT 2GB SCSI Internal	$1,164 00

Iomega

18375	TAPE 250M8 Internal	$159 98
18380	TRANSPORTABLE 150	$543 98

SyDos

12938	PRONOTE 42 MB Parallel	$339 98
12940	MARLIN 105M8 INT IDE	$459 98
12939	PUMA 105MB Parallel	$499 9B

Multimedia, Sound, CD

05689	ACS 300 Spkrs W/ Subwoofer	$239.98

Creative Labs

12900	Sound Blaster 16 SCSI-2	$177 98
12919	Sound Blaster 16 AWE32	$291 98
12536	Oiscovery 16 INT	$328 9B
14325	OigitalEdge MM Kit	$692 98

MEDIA VISION

10568	PRO Audio SPECT 16	$99 9B
12527	PRO Audio Studio 16	$119 98
97987	Reno Portable CO-ROM	$299 98

SONY

12548	Desktop Library Starter CDU-33	$229.98
12549	Desktop Library CDU-33 Int	$469 98
12626	Desktop Library CDU-7305 Ext	$469 98
13441	Turtle Beach Monterey Snd I.C.	$349 98
07866	Turtle 8each MULTISOUND	$429 98

CD-ROM/Optical Drives

NEC

97815	MultiSpin 3Xi Internal	$431 98
97814	MultiSpin 3Xe External	$464 98
97817	MultiSpin 4X Pro COR-900	$898 98
13414	Chinon COS535 INT CO-ROM KIT	$429.98
13401	Chinon COX535 EXT CO-ROM KIT	$579 98
17867	Legend Exec. CO w/Sound	$344 98

Plextor

19258	PX-43CH Quad Speed	$538 98
14690	7-Bay Tower CO-ROM	$3,900.00
17892	Sony CDU-55S Int. SCSI CO-ROM	$199 98

Plotters, Digitizers, Scanners

95242	Calcomp Slate 12x12 w/ Cordless1 6 Button Cursor	$246 9B

Summagraphics

17911	SummaSketch III 12x12 16 Button Cursor	$307 98
17912	SummaSketch III 1Bx24 4 Button Pen	$524 98

Monitors, Video Products

11825	Creative Labs VIDEO SPIGOT	$359 98

Diamond

18454	SPEEOSTAR PRO 1MB	$113 98
1B452	STEALTH PRO 1MB	$237 98
18455	VIPER VLB 2MB	$339 98

SONY

01156	Multiscan 15sf Monitor	$469 98
06909	GDM-17SE1 17" Multiscan Mtrs	$999 00

ATI

12620	Graphics ULTRA + 2MB	$203 98
11B91	Graphics ULTRA PRO 2MB	$357 98

Desktop Displays

17610	Kanaka FM361 14"	$199 98
17613	Kanaka 15'	$349 98
17608	Liberty 14" digital	$349 98
17607	Liberty 4128nll-MPRII Comp 14"	$344 9B
17609	Liberty 17 .28	$849 98

Hercules

1B385	Graphite PRO 1MB	$234 98
18386	Graphite 2M8	$368 98

Magnavox

19192	CM4017 17"	$648 98

Orchid

18389	CELSIUS VLB 1MB	$139 9B
18390	CELSIUS VLB 2MB	$249.9B
19194	Philips BRILLIANCE 17"	$995 98

Computers

AST COMPUTER

19074	Ascentia 900N DX 4/75 340MB Oual Clr	$3,923 00
17979	LC 4/33 170MB	$1,124 00
17980	LC 4/33 270MB	$1,323 00
17985	LC 4/25/50 270M8	$1,522 00
17977	LP 4/25/50 340MB	$1,799 00
17971	LP 4/66 340M8	$2,199 00
17992	LC 4/50 340M8	$2,599 00
1B016	MTE 4/66 NONE	$2,358 00
17957	4/50 340MB	$2,388 00
18017	MTE 4/66 420MB	$2,799 00
18022	LX PENTIUM/60 540MB	$4,172 00

Canon

19166	Innova Book 10 M33/120-Mono	$1,479.00
19167	Innova 8ook 10 M33/170-Mono	$1,549.00
19168	Innova 8ook 10 M33/260-MDND	$1,599 00

Sharp

18391	486/33 200MB PAS CLR W/TRK8ALL	$2,597.00
18392	486/33 200M8 ACT CLR W/TRK8ALL	$2,997 00

TEXAS INSTRUMENTS

12628	TM4000E SX/25 120MB Oual Clr	$1,699 00
13678	TM4000M SX/25 120MB Mono	$1,999 00
13679	TM4000M SX/25 120M8 Dual Clr	$2,349 00
13680	TM4000M SX/25 120M8 Active Clr	$3,179.00
13671	TM4000E DX4/75 340M8 Active Clr	$3,649 00
17623	TM4000M DX4/75 120M8 Active Clr	$4,945.00
13672	TM4000E DX4/75 455M8 Active Clr	$4,947 00

TOSHIBA

19104	T1910 200MB Mono	$1,699 00
19107	T3400 120MB Mono	$1,898 00
19108	T3400CT 120MB Active Clr	$3,359 00
19110	T4700CS 320MB Dual Clr	$3,366 00
19100	T6600C 510MB Active Color	$6,059 00

NEC

15204	Versa 40E PC-440-0511	$2,467.00
15209	Versa 50E PC-450-0521	$3,114.00
15201	Versa 40EC PC-440-1531	$3,933 00

Printers

1B393	Sharp JX9400 300DPI 4PPM	$477 98

Canon

13670	BJ-200E	$289 98
18234	BJ-230	$459 98
13668	BJC-600 COLOR	$579 98

Costar

17617	LabelWriter XL PLUS DOS/WIN	$23B.98

Epson

17640	Stylus 300 Ink Jet	$228 80
17641	Stylus 800 Ink Jet	$251 97
17642	Action Laser 1500	$656 70
17639	DFX-B000	$2,269 45

HEWLETT PACKARD

13684	OeskJet 520	$289 98
13681	DeskJet Portable 310	$299 9B
1852B	LaserJet 4L	$679 9B
18529	LaserJet 4P	$979 9B

NEC

13112	Super Script 610	$488 9B

Panasonic

17619	KX-P5400M1	$B49 00
17618	KX-P4400	$529 9B

TEXAS INSTRUMENTS

06859	MicroWriter PS23	$677 98
14319	MicroLaser PRO 600 PS23	$1,399 00
12525	MicroWriter BASIC	$517.16
06860	MicroWriter PS65	$949.98

Hard Drives & Controllers

Conner

14625	213MB IOE	$219 98
14626	426M8 IDE	$309 98
14633	1 06G SCSI	$B35 98
1B960	Hewlett-Packard 1 05G SCSI	$827 98

Maxtor

18395	171MB IOE	$193 98
18397	345MB IOE	$256 98
1B398	345M8 SCSI	$272 98
18399	540MB SCSI	$674 98

Seagate

1B95B	452MB IOE	$327 9B
1B959	52BMB IDE	$449 9B
14631	1.05G SCSI	$865 9B
19001	AccuLogic IOE W/1 PAR 2/SER 1/GAME	$35 98
19003	ACCULOGIC VL8 IOE	$98 98

Adaplec

19005	ADAPTEC 1542CF SCSI-2	$265 9B
19006	ADAPTEC 2742T EISA SCSI-2	$339.98

Modems & Communication

intel

13640	FaxModem 144/144i	$119 98
13641	FaxModem 144/144e	$139 98

Hayes

11664	Accura 24EC + Fax 96 EXT	$89 98
19017	Accura 96 + Fax 96 INT	$148 98
19018	Accura 14.4 + Fax 14.4 INT	$153 98
12183	Accura 14.4 + Fax 14 4 EXT	$189 98
11666	Optima 14 4 + Fax 14 4 EXT	$411 98

Practical Peripherals

19024	14 4 INT W/Fax	$109 98
12378	14 4 Mini Tower W/Fax	$233 98
19027	14 4 ProClass INT W Fax	$165 98
19025	28 8 INT W/Fax	$279 98
19026	28 8 Mini Tower W/Fax	$298 98
19030	28 8 ProClass INT w/Fax 115K DTE	$309 98
19031	28 8 PROCLASS Mini Tower W/Fax 115K DTE	$336 98
19032	28 8 PROCLASS EXT LCO W/Fax 115K CTE	$379 9B
19033	2B 8 PROCLASS Mini Tower W/Fax 230K DTE	$399 9B

US Robotics

18458	14 4 INT	$125 98
18452	14 4 EXT	$135 98
18456	V 32TERBO EXT	$378 9B
18453	V.32TERBO INT W/Fax	$445 9B

Backup and UPS

American Power

94396	APC Personal SurgeArrest 7 Dutlet	$18.98
94395	APC Personal SurgeArrest 7 Dutlet w/Phone	$29 98
07150	BACK UPS 250	$119 98
05901	BACK UPS 450	$239 98
11651	BACK UPS 600	$335 98
11233	SMART UPS 1250	$805 98

Tripp Lite

06861	BC400	$174 98
19042	SMART 250 LAN	$232 98
19043	SMART 400 LAN	$279 98
19046	SMART 750 LAN	$428 9B
1904B	SMART 1250 LAN	$659 9B

PCMCIA

1B986	GVC NIC-2000BTP PCMCIA CDAX/10BT	$167 9B

intel

1B400	Intel 24/96 W/Fax	$121 98
1B401	Intel 96/96 W/Fax	$186 98
1B402	Intel 14.4 W/Fax	$195 98
18403	Maxtor MOBILMAX 105MB HO	$449.98

Megahertz

13072	Megahertz 2400 XJACK W/Fax	$139 98
13071	Megahertz 14 4 W/Fax	$219 98
13098	Megahertz 9600 XJACK W/Fax	$289 98
15729	Megahertz Gold 14 4 XJack w/Fax	$239 9B
1535B	National Semi NE4100 ENET Coax	$169 98
15359	National Semi NE4100 Ethernet 10T	$169.98
19049	TRANTOR SLIM SCSI-2	$279.98

Xircom

18405	CreditCard ENET CDAX	$222 98
18404	CreditCard ENET 108T	$22B 98
18406	CreditCard ENET 10BT/COAX	$266 98

Memory

	Memory Products and More	CALL
	PNY	CALL

Processors/Upgrades

	Cyrix	CALL
	Intel	CALL

Math Coprocessors

intel

18411	387SX 16-25MHZ	$75.98
1B409	387SX 33MHZ	$87 98

PLEASE USE THIS COOE TO RECEIVE THESE SPECIAL PRICES **PC09**

MasterCard DISCOVER VISA AMERICAN EXPRESS

1•800•252•0386

Circle 203 on reader service card.

MEMORY · MEMORY · MEMORY

LAPTOP & NOTEBOOK MEMORY

AST

PowerExec 4/25SL
4MB $179
16MB $749

PowerExec 3/25SL, 3/25SL-C, EL
Premium Exec 286, 386SX/20, 25, 25C
8MB $109
16MB $349

Compaq

Aero
4MB $119
8MB $239
16MB $479

Concerto 486
4MB $119
8MB $239
16MB $479

Contura 3/20, 3/25, 3/25c
4MB $119
8MB $239

Contura 4/25 series
4MB $119
8MB $239

LTE 386s/20
4MB $129

LTE Lite 20s; 25s, 25s
4MB $129
8MB $239
16MB $479

LTE Lite 4/25c
4MB $119
8MB $239

SLT 386s/20
4MB $129
8MB $239

IBM

PS/2 CL57SX and ThinkPad 700, 700c, 720, 720c
4MB $209
8MB $389
16MB $959

ThinkPad 710T
4MB $189
8MB $319

H51 Notebook (4MB)
4MB $99

L40SX, N33SX, PS/Note 102
8MB $149

L40SX, PS/Note 102
8MB $299

NEC

UltraLite Versa (4MB models)
4MB $229
8MB $449
(Including 4MC & 8MC models) (4MB) ($99)

UltraLite SL/25C
2MB $79
4MB $149

UltraLite SL/20, SL/20P
2MB $79
4MB $129

ProSpeed 286, 386SX/16
2MB $79
4MB $129

Texas Instruments

TravelMate 3000 (all models)
2MB $79

TravelMate 4000 (all models)
4MB $189

TravelMate WinSL/25
8MB $129

Toshiba

T1000SE/LE/T2; 2000, 2000SE/SL
2MB $99

T3200SL/T3000 Series
4MB $169
8MB $319

T3200EL 1600, 3100H
2MB $89

T3100SL, 3200SL/SX
2MB $149
4MB $249

T3300SL
2MB $149
4MB $249
16MB $835

T4300
4MB $219
8MB $419

T4400, T6400 (all models)
4MB $219
16MB $499

T1900, T4500, T4600, T4700 (all models)
4MB (2.8 V) $429
16MB (3.0 V) $1,799

T5400, T5200; T5300; T8300
4MB $179
8MB $349

Zenith

NEW Z-Note 320L, 320Lb, 325L, 325Cd
2MB $108
4MB $384

Z-Note 425 Series
2-Short 4205, 4255
4MB $188

MasterPart 386SL, SCL, Slim
8MB $319

MasterPart 386SX
2MB $139

SuperPart SL, 286sp, SlimPart
4MB $239

SuperPart 286, 386sx
16MB $1,239

SuperPart 386s, SlimPart
8MB $319

SIMMS

1x9 (3-chip) ...	$43
4x9	$155
1x36	$181
2x36	$354

1MB x 9 70ns (9 chip) $46
512K x 36-70 (1MB) $155
1MB x 9 70ns $155
1MB x 36-70 (4MB) $354
2MB x 36-70 (8MB) $354

REMOVABLE STORAGE

FEATURING

SyQuest REMOVABLE TECHNOLOGY

3.5" 270MB & 105MB
5.25" 44MB, 88MB & 200MB
Removable Hard Disk Drives

- All drives are bootable/formatted with the same form
- Two year warranty on all drives

3.5" Removable	Internal	External
270MB, 105 Ms, 16ms	$299	N/A
270MB, 105, 13ms	$449	N/A
105MB, SCSI, 14 5ms	$249	$365
270MB, SCSI, 13 5ms	$449	$499
5.25" Removable	**Internal**	**External**
44MB, SCSI, 29ms	$189	$249
88MB, SCSI, 28ms	$279	$339
200MB, SCSI, 18ms	$399	$449
Cartridges		
105MB/270MB		$59/$89
44MB/88MB/200MB		$39/$59/$99

FAX/MODEMS

Megahertz

PCMCIA 2.0 Date/Fax
33/C 14.400bps FAX/Modem 9/C144/Gold 9/C144 ..... $229 /$259
14.400bps FAX/Modem direct connect to satellite cellular phone $369

USRobotics

WorldPort 14,400 Fax, PCMCIA
$209
Sportster 14,400 Fax, External
$149
Sportster 14,400 Fax, Internal
$119

MONITORS

ADI

(*P* models meet ergo TCO Guidelines requirements)

MicroScan III, 14" 28 dot, 1024x768 NI-60 72 Hz $349
MicroScan 20/500P, 14", 28dpi, 16 ns, RGB color ediport ..... $381/$359
MicroScan 4G/4G0, 14", 28 dpi, Tilt, 16-ms monitor ..... $429/$445
MicroScan 5DP, 17", 28dpi, Tilt, 16-ms, mono diagnosis $2 49
MicroScan 5AP, 17", 28dpi, Tilt, 16-ms, mono diagnosis $2 99

CPU UPGRADES

Cyrix

486 Upgrades
Cx486dlc/33/66 ..... $249
Cx486dlc/25/40 ..... $249
Cx486dlc/25/50 ..... $289
Cx486dlc+/25/50 ..... $289
Cx486dlc+/20/40 ..... $249

Evergreen

Evergreen Rev to 486
3M/63/A, 20 x2/x3 ..... $229/$429
3M/63/A, 25 x2/x3 ..... $249/$499
3M/63S x2/x3 ..... $319/$499
3M/63S x2/x3 ..... $489/$699

Intel

Intel OverDrive Processors
OverDrive 486DX 50 for 486DX16, 20, 25 ..... $309
OverDrive 486DX 50 for 486DX25 ..... $309
OverDrive 486DX4 66 for 486DX33 or 0133 ..... $329
OverDrive 486DX4 66 for 486DX25 ..... $329
OverDrive 486DX2 50 for 486DX16, 20, 25 ..... $229

Kingston

SX/Now! 16k CPU Upgrade
32MHz (SX) $149
33MHz (SX) $159

SLC/Now! 64k CPU Upgrade
25MHz (SX) $219
50MHz (SX) $299

LASER MEMORY

Canon LBP-4, 4Lite, 4Plus
16D-32D ..... 256k 2MB N/A $145

Epson EPL 6000
2MB ..... 128D 4MB N/A $198

Epson ActionLaser II, EPL-8000
2MB N/A ..... 512D 8MB N/A $449

HP LaserJet IIIsi, 4, 4M, 4Si, 4SiMX, 3L300, Inkjet 600
4MB ..... C2056A ..... 512D 8MB ..... C2056A $354

HP LaserJet IIP, IIS, IIIP, IIIS
4MB ..... C2037A ..... 512D 4MB ..... 32470A $379

HP LaserJet IIIP, IIIP
4MB ..... C3134A ..... 512D 4MB ..... 33445A $395

IBM Laser Printer 4019 and 4029
2MB ..... 33446A ..... 994 4MB ..... 11833335 ..... $357

OkiLaser 400
2MB ..... 70014701 ..... 512 2MB N/A $166

Panasonic 4410 & 4420
2MB ..... KX-P4410 ..... 512k 4MB N/A $181

Panasonic 4450 & 4430
2MB ..... KX-P4451 ..... 512 4MB N/A $189

Texas Instruments Microlaser and XL
2MB ..... 2550239-0001 ..... 54k 4MB ..... 2560052-0002 ..... $199

WE SET THE STANDARD!

- **100% GUARANTEED**
  Memory Guaranteed - 100% Compatible in form, fit & function!
- **EASY TO INSTALL**
  All products user installable, installation instructions included with most memory products
- **FREE SUPPORT**
  Free technical support & direct dial lines for immediate response
- **SPECIAL PRICING**
  Government & educational pricing, special volume pricing
- **PLUS**
  Overnight delivery available
  No surcharge on credit cards
  Corporate PO's, APO/FPO's welcome

30 DAY GUARANTEE

DON'T SETTLE FOR LESS!

CALL FOR ANY MEMORY

WE STOCK MEMORY UPGRADES FOR THOUSANDS OF COMPUTERS AND PRINTERS

UPGRADE NOT LISTED?

TOLL FREE FROM USA & CANADA
800-705-9866

INTERNATIONAL ORDERS
714-448-7750

FAX ORDERS
714-448-7760

BUSINESS HOURS:
Monday - Friday, 7am-5pm, P.S.T.
Saturday, 9am-5pm, Orders Only

The Source International, Inc.

MAIL OR FAX ORDERS TO:
First Source International, Inc.
7 Journey
Aliso Viejo, CA 92656

Our Guarantee: First Source International, Inc. will gladly replace memory upgrades or computer products 30 days of the original invoice date. Memory is 100% compatible. Customer must call for RMA. Opened software is non-returnable. Returns are subject to 10% restocking fee. Freight charges are the responsibility of the customer. Defective merchandise will be replaced. Please call or contact our customer service department. Memory products are designed and manufactured to meet or exceed manufacturer specifications. Tel-U-1 is a registered trademark of Tel-U-1, Inc. Prices and availability are subject to change without notice. Purchasing prices at the time of order are final. First Source International cannot be responsible for errors in typography or photography. Trademarks and registered trademarks are the respective companies.

CALL THE UPGRADE EXPERTS 800-705-9866

4104H-XX $39.95
Counts as 2/Hardcover

6817668P-XX $27.95
Counts as 2

3046P-XX $28.85
Counts as 2

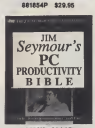
681767P $18.95

6818206P $28.95

681854P $29.95

4262H-XX $39.95
Counts as 2/Hardcover

6819768P $24.95



9409H $34.95
Hardcover

Select any 5 books for only $4.95 (Values to $184.75)

plus 1 book FREE upon prepayment
when you join
The Computer Book Club®

Get 5 Books for only $4.95

plus 1 book FREE upon prepayment
when you join *The Computer Book Club®*

YES! Rush me the following titles, billing me just $4.95 (plus shipping/handling & sales tax). Enroll me as a member of **The Computer Book Club** according to the terms outlined in this ad. If not satisfied, I may return the books within 10 days for a full refund and my membership will be cancelled. I agree to purchase just 3 more selections at regular Club prices during the next 2 years and may resign anytime thereafter.

Code #'s of my books for $4.95

If you select a book that counts as 2 choices, write the book number in one box and XX in the next.

☐ Bill me (FREE book not available with this payment option.)

SPECIAL OFFER! Prepay your order by check, money order, or credit card and receive a 6th book of your choice FREE.

- **YES!** I want the FREE BOOK indicated below. My Introductory payment of $4.95 plus $4.95 shipping/handling* and applicable sales tax is enclosed. **Code # of my FREE book:** _____

☐ Check or money order enclosed made payable to: McGraw-Hill, Inc.
☐ Charge my: ☐ VISA ☐ MasterCard ☐ Amer. Exp. ☐ Discover

Acct. No. _____ Exp. Date _____
Signature _____
(required on all credit card orders)
Name _____
Address/Apt.# _____
City _____ State _____
Zip _____ Phone _____

Offer valid for new members only, subject to acceptance by CBC. U.S. orders are shipped 4th Class Book Post. Canada must remit in U.S. funds drawn on U.S. banks. *Canadian orders are shipped International Book Post—add $9.95 shipping/handling. Applicants outside the U.S. and Canada will receive special ordering instructions. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC PCC994

Get 5 Books for only $4.95

plus 1 book FREE upon prepayment
when you join *The Computer Book Club®*

YES! Rush me the following titles, billing me just $4.95 (plus shipping/handling & sales tax). Enroll me as a member of **The Computer Book Club** according to the terms outlined in this ad. If not satisfied, I may return the books within 10 days for a full refund and my membership will be cancelled. I agree to purchase just 3 more selections at regular Club prices during the next 2 years and may resign anytime thereafter.

Code #'s of my books for $4.95

If you select a book that counts as 2 choices, write the book number in one box and XX in the next.

☐ Bill me (FREE book not available with this payment option.)

SPECIAL OFFER! Prepay your order by check, money order, or credit card and receive a 6th book of your choice FREE.

- **YES!** I want the FREE BOOK indicated below. My Introductory payment of $4.95 plus $4.95 shipping/handling* and applicable sales tax is enclosed. **Code # of my FREE book:** _____

☐ Check or money order enclosed made payable to: McGraw-Hill, Inc.
☐ Charge my: ☐ VISA ☐ MasterCard ☐ Amer. Exp. ☐ Discover

Acct. No. _____ Exp. Date _____
Signature _____
(required on all credit card orders)
Name _____
Address/Apt.# _____
City _____ State _____
Zip _____ Phone _____

Offer valid for new members only, subject to acceptance by CBC. U.S. orders are shipped 4th Class Book Post. Canada must remit in U.S. funds drawn on U.S. banks. *Canadian orders are shipped International Book Post—add $9.95 shipping/handling. Applicants outside the U.S. and Canada will receive special ordering instructions. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC PCC994

MEMORY · MEMORY · MEMORY

LAPTOP & NOTEBOOK MEMORY

AST

PowerExec 4/25SL	4MB	$179
	16MB	$769
PowerExec 3/25SL, 3/25SL-C, EL	4MB	$179
Premium Exec 286, 386SX/20, 25, 25C	4MB	$179
NEW Bravo NB 486	4MB	$285
	16MB	$839

Compaq

NEW Aero	8MB	$299
	16MB	$599
NEW Concerto 486	8MB	$399
	16MB	$775
Contura 3/20, 3/25, 3/25c	8MB	$295
	16MB	$585
Contura 4/25 series	8MB	$295
	16MB	$565
LTE 386S/20	8MB	$229
LTE Lite 20; 25; 25c, 25n	4MB	$229
	8MB	$295
	16MB	$589
LTE Elite 4/25c	8MB	$319
	16MB	$599
SLT 386s/20	8MB	$199
	16MB	$199

IBM

NEW PS/2 CL57SX and ThinkPad 700, 700c, 720, 720c	4MB	$209
	8MB	$389
	16MB	$1050
ThinkPad 710T	4MB	$189
	8MB	$259
	2MB	$99
HS1 Notebook (All)	4MB	$189
L40SX, N33SX, PS/Note 182	4MB	$149
L40SX, PS/Note 182	8MB	$295

NEC

NEW UltraLite Versa (all models)	4MB	$229
	8MB	$449
(Excluding 4DX & 50X models)	16MB (3.0)	$950
UltraLite III, SL/25C	2MB	$99
	4MB	$169
UltraLite SL/20, SL/20P	2MB	$99
	4MB	$259
ProSpeed 286, 386SX/16	4MB	$179

Texas Instruments

TravelMate 3000 (all models)	2MB	$79
TravelMate 4000 (all models)	4MB	$189
TravelMate WinDel/C/25	2MB	$129

Toshiba

T1000SE/LE/XE; 2000; 2000SX; 5Ax, T2200SX, T1800 Series	2MB	$99
	4MB	$169
	8MB	$319
T1200XE, 1600, 3100E	2MB	$89
T3100SX, 3200SX, 5SC	2MB	$79
	4MB	$149
T3300SL	4MB	$169
	8MB	$399
	16MB	$955
NEW T3400	4MB	$219
	8MB	$419
T4400, T8400 (all models)	4MB	$189
	16MB	$699
NEW T1900, T4500, T4600, T4700 (all models)	8MB (3.11)	$429
	16MB (3.11)	$959
T5400, T5200; T5200C, T8500	2MB	$89

Zenith

NEW Z-Note 320L, 320LD, 325L, 325LC	2MB	$108
	8MB	$384
	8MB (3.11)	$499
NEW Z-Note 425 Series	4MB	$188
Z-Sport 4205, 4255	2MB	$99
MasterPort 386SL, SLC, SLx	2MB	$89
MasterPort 386SX	2MB	$159
SuperPort SX; 286e; SlimPort	2MB	$159
SuperPort 386; 386e	1MB	$139
SuperPort 386e; SlimPort	4MB	$299

SIMMS

1x9 (3-chip) ...	$43
4x9	$155
1x36	$181
2x36	$354

1MB x 9-Chip (9-chip)	$46
512K x 36-70 (SIMM)	$85
4MB x 9-Chip	$155
1MB x 36-70 (4MB)	$181
2MB x 36-70 (8MB)	$354

REMOVABLE STORAGE

FEATURING SyQuest REMOVABLE TECHNOLOGY

3.5" 270MB & 105MB
5.25" 44MB, 88MB & 200MB
Removable Hard Disk Drives

- All drives are backward compatible with the same form
- Two year warranty on all drives

3.5" Removables	Internal	External
105MB, IDE, 14 Sec.	$139	N/A
270MB, IDE, 13.5ms	$449	N/A
105MB, SCSI, 14 Sec.	$249	$389
270MB, SCSI, 13.5ms	$488	$645

5.25" Removables	Internal	External
44MB SCSI, 70ms	$189	$249
88MB, SCSI, 30ms	$329	$389
200MB, SCSI, 18ms	$399	$448

Cartridges

105MB/270MB	$39/$49
44MB/88MB/200MB	$38/$68/$99

FAX/MODEMS

Megahertz

PCMCIA 2.0 Data/Fax

33K3 (14,400bps/TAS/Modem 2211AH/Gold 2211AH)	$229/$259
NEW 14,400bps/TAS/Modem dual connect w/ selective cellular phones	$389

USRobotics

WorldPort 14,400 Fax, PCMCIA	$209
Sportster 14,400 Fax, External	$139
Sportster 14,400 Fax, Internal	$119

MONITORS

ADI

(*2" models meets EPA Energy Star requirements)

MicroScan 3E-, 14" .28 dp, 1024x768 NI @ 72 Hz $389

WE SET THE STANDARD!

30 DAY 100% SATISFACTION GUARANTEE

- **100% GUARANTEED** — Memory Guaranteed - 100% Compatible in form, fit & function
- **EASY TO INSTALL** — All products user installable, installation instructions included with most memory products
- **FREE SUPPORT** — Free technical support & direct dial lines for immediate response
- **SPECIAL PRICING** — Government & educational pricing, special volume pricing
- **PLUS . . .** — Overnight delivery available. No surcharge on credit cards. Corporate PO's, APO/FPO's welcome

DON'T SETTLE FOR LESS!

CALL FOR ANY MEMORY

WE STOCK MEMORY UPGRADES FOR THOUSANDS OF COMPUTERS, PDA

PERSONAL COMPUTER MEMORY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 9 BLUE RIDGE SUMMIT, PA

POSTAGE WILL BE PAID BY ADDRESSEE

The Computer Book Club®
A Division of McGraw-Hill, Inc.
Blue Ridge Summit, PA 17214-9973

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

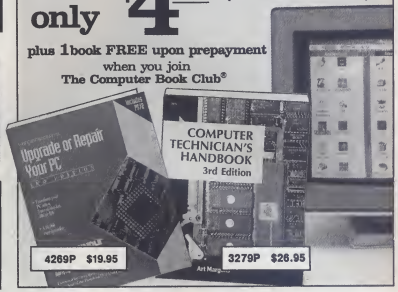
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 9 BLUE RIDGE SUMMIT, PA

POSTAGE WILL BE PAID BY ADDRESSEE

The Computer Book Club®
A Division of McGraw-Hill, Inc.
Blue Ridge Summit, PA 17214-9973

Select any 5 books for only $4.95 (Values to $184.75)

plus 1 book FREE upon prepayment when you join The Computer Book Club®



4104H-XX $39.95
Counts as 2/Hardcover

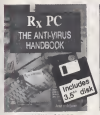
891788P-XX $27.95
Counts as 2

3049P-XX $29.95
Counts as 2

981767P $19.95

891820P $29.95

981654P $29.95



42521H-XX $39.95
Counts as 2/Hardcover

881975BP $24.95

9409H $34.95
Hardcover

881884XP $24.95

058663H-XX $70.50
Counts as 2/Hardcover

881909P-XX $29.95
Counts as 2

881833XP-XX $29.95
Counts as 2

4196P $22.95

8920148P $27.95

057672H $30.00
Hardcover

3066P $39.95

881821P-XX $39.95
Counts as 2

9306P $26.95

4360H-XX $39.95
Counts as 2/Hardcover

4209P $18.95

588106P $29.95
Softcover

8919286P $27.95

4088P-XX $28.95
Counts as 2

881937P $27.95

0415785P $29.00

3943P $19.95

4220H-XX $39.95
Counts as 2/Hardcover

449H-XX $39.95
Counts as 2/Hardcover

As a member of The Computer Book Club . . .

. . .you'll enjoy receiving Club bulletins every 3-4 weeks containing exciting offers on the latest books in the field at savings of up to 50% off of regular publishers' prices. If you want the Main Selection do nothing and it will be shipped automatically. If you want another book, or no book at all, simply return the reply form to us by the date specified. You'll have at least 10 days to decide. If you ever receive a book you don't want, due to late mail delivery of the Bulletin, you can return it at our expense. And you'll be eligible for *FREE* BOOKS through our Bonus Book Program. Your only obligation is to purchase 3 more books during the next 2 years, after which you may cancel your membership at any time.

PCC094

All books are softcover unless otherwise noted. Publishers' prices shown. If you select a book that counts as 2 choices, write the book number in one box and XX in the next. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC

If card is missing, write to:
The Computer Book Club, Blue Ridge Summit, PA 17294-0820

"So tell me, what makes VTech different from all the other computers in this magazine?"

Rick Mazursky
President
VTech Computers

"For starters, how about more than 10 years in the business."

For more than a decade we've been building our presence in the computer industry, creating a personal computer that now ranks amongst the top in the world. We give all the credit for this success to the thousands of staff members that make up our integrated worldwide network.

We're also preparing to lead the technology revolution into the next century through a commitment to research and development that guarantees our customers always receive the latest products.

"If that's not enough, you can pick only the options you need."

We believe a computer company has to understand the needs of the people who use them. So we've introduced a new buying system called the **"As You Like It" Complete Customization Program,** and it works like this:

- Call our product consultant. He'll help you choose the best base system.
- Pick only the options you want to create your personalized computer.
- Our engineers will custom build your system using the components you requested.
- Your personalized system is then delivered directly to you.

And of course, your new system is pretested and approved, and all parts and labor are covered by the VTech warranty.

"You never have to worry, if you need us we'll be there."

As our customer you have the right to expect the best service, quality and performance from our people and products. As a VTech customer you can rely on:

- Guaranteed replacement parts–FAST!
- A continuously trained technical support staff that is updated on all the latest technology to give you the kind of service that gets you running, and keeps you running.
- Someone will always be at your disposal at convenient hours.
- One phone call to one person on our technical support staff will handle all of your problems.

"Talk about quality control, we're our own manufacturer."

The reliability of our product quality is the direct result of our own manufacturing excellence. We make our own motherboards, easy-touch keyboards, and power supplies so that we can ensure only the highest quality product, and pass on the cost savings to you. It also allows us to use environmentally safe processes.

Also, throughout the manufacturing process we test every operation to make sure each piece stands up to our strict performance standards.

Finally, we work with only the most respected leaders in the industry like Intel, Orchid, Colorado, and Conner. Testing everything for its compatability.

"But you don't have to take my word for it."

"The overall performance of the VTech computer gives it the highest rating of the 486 systems, and jaw-dropping price is outstanding."

Computer Shopper, February, 1994

"Serious systems and bare-knuckles pricing make VTech the best…"

PC Computing, July 1994

PC Computing
★★★★

VTECH®
expotech™

1-800-816-0070

VTech's Personal Tower

The new LT400 Series Notebook
The LT432C/453C have a right-side mounted trackball.

Multimedia systems

High-performance Pentium™ systems

VTech's new High-Tech Tower

VTech's new 5-Bay Desktop

LT432C 486SX/33	LT453C 486DX/33	LT450C 486DX/33	LT470C 486DX4/75
• 4MB RAM expandable to 20MB • 200 MB Hard Drive • 5.5 lbs. • NiMH Battery • 9.7" Sharp" Dual Scan Color Screen • Accelerated Video • Right-side Mounted Trackball • Small (11" x 8.4" x 1.8") Footprint • 2 PCMCIA Type II and 1 Type III • Pre-Loaded MS-DOS 6.2 & Windows 3.1	• 4MB RAM expandable to 20MB • 200 MB Hard Drive • 5.5 lbs. • NiMH Battery • 9.7" Sharp" Dual Scan Color Screen • Accelerated Video • Right-side Mounted Trackball • Small (11" x 8.4" x 1.8") Footprint • 2 PCMCIA Type II and 1 Type III • Pre-Loaded MS-DOS 6.2 & Windows 3.1	• 4MB RAM expandable to 20MB • 340 MB Hard Drive • 6 lbs. • NiMH Battery • 9.7" Sharp" Dual Scan Color Screen • Accelerated Video • Center-mounted 19mm Trackball with Palm rest • Small (11" x 8.5" x 2") Footprint • 2 PCMCIA Type II and 1 Type III • Pre-Loaded MS-DOS 6.2 & Windows 3.1	• 8MB RAM expandable to 20MB • 455 MB Hard Drive • 6 lbs. • NiMH Battery • 9.7" Sharp" Dual Scan Color Screen • Accelerated Video • Center-mounted 19mm Trackball with Palm rest • Small (11" x 8.5" x 2") Footprint • 2 PCMCIA Type II and 1 Type III • Pre-Loaded MS-DOS 6.2 & Windows 3.1
$1799	**$1999**	**$2199**	**$2699**

VTech Upgrades

Choose from these options to create the computer you've always wanted.

Tape Back-Up	RAM	Modem	Floppy Drives	Hard Drives	Multimedia	Monitor	Video Card
• 250MB Colorado	• 4MB RAM • 8MB RAM • 16MB RAM • 32MB RAM	• 9600/2400 Data Fax Modem • 14,400 bps Fax/Modem • Remote Diagnostic Program • Prodigy 30-day free trial	• 5.25" Diskette Drive • Combo 3.5" and 5.25" Diskette Drives	• 210MB 14ms IDE • 270MB 13ms IDE • 424MB 13ms IDE • 527MB 12ms IDE	• 16-Bit Stereo Sound Board • Double Speed CD-ROM • Koss Speakers • Multimedia Software Bundles	• 14" NI HiRez • 15" NI HiRez • 17" NI HiRez • 21" NI HiRez	• Diamond • Orchid Kelvin 64

The VTech/GE Service Plus Program

With VTech's on-site service, in conjuction with the optional extended GE Service Plan, you'll get 4 years of superior technical service and support. It's the ultimate in security from the top name in service, at a very low price. You won't find it offered by any other direct seller.

Service Protection Plus

VTech Software Bundles

Top multimedia software bundles each with 4 CD-ROM's that are tested and certified by VTech to work with your configuration. Each bundle costs you only $59, saving you hundreds of dollars from the manufacturer's list price.

THE GREAT OUTDOORS

San Diego Zoo: Animals - See and hear your favorite animals from around the world. Includes 60 minutes of video clips.

Ocean's Below - Over 200 video segments are included in the underwater exploration of exotic destinations. 125 photos of underwater plant life, animals, and plane wrecks.

Everywhere USA - This CD is great for vacation planning with over 3,000 attractions and things to do. Covers all of the United States.

Adventures - An exploration of unusual travel expeditions and adventurous vacations. Comes with over 1,000 tours and 2,500 full color photos.

HOME, HEALTH & FAMILY

Compton's Interactive Encyclopedia - A 26 volume encyclopedia with pictures, drawings, and photos. Includes on-line Merriam-Webster Dictionary.

Mayo Clinic Family Health Book - Provides reliable, practical, and easy to understand information concerning issues on good health. Most of the information comes from physicians and research scientists at the Mayo Clinic.

Family Choices - 15 best-selling titles for the whole family. Everything from business to great books to puzzles for the kids.

Healing Foods Cookbook - 400 recipes on eating healthy including nutrition studies.

JUST FOR FUN

7th Guest - A virtual multimedia mystery! You wander through a 3D haunted house solving puzzles.

MegaRace - A futuristic virtual driving experience. 3D graphics and high speed chases with deadly weapons.

Star Wars Chess - Star Wars characters come to life in this fully animated chess game. Over 70 capture sequences. Allows for different skill levels.

CD Challenge Pack - 9 different game titles including RoboCop 3D and The Chessmaster 2100.

intel inside · PRODIGY Service · PC Computing ★★★★★ · Novell Labs Tested & Approved · ORCHID

VTECH® expotech

1-800-816-0070

Government & Education 1-800-947-6461.

VTech Computers, Inc., 800 Church Street, Lake Zurich, Illinois 60047 Fax 1-800-947-3976

Circle 196 on reader service card

"With a product line this great, the only thing better would be amazingly low prices. Just like these."

EXPO 486SX/33V

- Pentium™ Technology Ready
- 4MB RAM with 128K Cache
- 213MB (12ms) Conner IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$999

EXPO 486SX/33VM

- Pentium™ Technology Ready
- 4MB RAM with 128K Cache
- 424MB (14ms) Conner IDE Hard Drive
- Double Speed CD-ROM
- 16-Bit Stereo Sound Board
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1349

EXPO 486DX/33V

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 4MB RAM with 128K Cache
- 424MB (14ms) Conner IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1299

EXPO 486DX2/50VM

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 4MB RAM with 128K Cache
- 424MB (14ms) Conner IDE Hard Drive
- Double Speed CD-ROM
- 16-Bit Stereo Sound Board
- Stereo Speakers
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1599

EXPO 486DX2/66V

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 4MB RAM with 128K Cache
- 424MB (14ms) Conner IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1399

EXPO 486DX2/66VM

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB RAM with 128K Cache
- 527MB (12ms) Conner IDE Hard Drive
- Double Speed CD-ROM
- 16-Bit Stereo Sound Board
- Stereo Speakers
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1799

Platinum 486DX2/66 PCI

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB RAM with 256K Cache
- 424MB (14ms) Conner IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- 14" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1649

Platinum 486DX2/66 PCI

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB RAM with 256K Cache
- 527MB (14ms) Conner IDE Hard Drive
- Double Speed CD-ROM
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- 15" VTech SVGA HiRez Monitor
- Dual Cooling Fans
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1899

Platinum P5-60

- Intel 60 MHz Pentium™ CPU
- 8MB RAM with 256K Cache
- 424MB (14ms) Conner IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- Enhanced Parallel Port
- High Speed Serial Port Controllers
- 14" VTech SVGA HiRez Monitor
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1849

Platinum P5-60

- Intel 60 MHz Pentium™ CPU
- 8MB RAM with 256K Cache
- 527MB (14ms) Conner IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- Enhanced Parallel Port
- High Speed Serial Port Controllers
- 15" VTech SVGA HiRez Monitor
- Double Speed CD-ROM
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$2099

Platinum P5-66

- Intel 66 MHz Pentium™ CPU
- 8MB RAM with 256K Cache
- 424MB (14ms) Conner IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- Enhanced Parallel Port
- High Speed Serial Port Controllers
- 15" VTech SVGA HiRez Monitor
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$1999

Platinum P5-66

- Intel 66 MHz Pentium™ CPU
- 16MB RAM with 256K Cache
- 527MB (12ms) Conner IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Built-In SCSI Adapter
- 3.5" Diskette Drive
- Enhanced Parallel Port
- High Speed Serial Port Controllers
- 15" VTech SVGA HiRez Monitor
- Double Speed CD-ROM
- Pre-Loaded MS-DOS 6.2 & Windows 3.1
- Enhanced 101-Key Keyboard & Mouse

$2499

USA Flex... Name Brands for Less!

PC/Computing Direct Top 60, July 1994

HEWLETT® PACKARD Authorized Dealer

FLEX SPECIAL
HP DeskJet 550C Printer

HP's high-quality twin-cartridge black and color printer

Order Today! Sensational Savings!

$429 C2121A

- 300 dpi Laser Quality
- Dual inkjet cartridge system for Simultaneous true black and color printing
- Up to 16.7 million colors
- Feeds up to 100 sheets (letter or legal)
- 3-Year Warranty-the longest in the industry

Ink cartridge Color: *51625A* /Black *51626A*..... *•29/•25*

COMPAQ
LTE Lite/25E
At Our Lowest Prices Ever!

The Compaq LTE Lite 25E features Intel 386SL-25MHz processor, 64K Cache, 4MB RAM (Max. 20MB), 8.5"x 11"x 2", 6.3 lbs., 9.5" high contrast active matrix mono LCD, MS-DOS, Windows & Integrated TrackBall

	Limited Quantity
LTE Lite/25E 84MB Hard Drive *138000-003*	•949
LTE Lite/25E 120MB Hard Drive *138000-004*	•999

IBM *ThinkPad® 500* Major Price Reduction!
Starting At...
$799

Ask Your Sales Consultant For Specific Model Features

ThinkPad 350C 125MB	•1799
ThinkPad 350C 250MB	•2199
ThinkPad 500 95MB	•799
ThinkPad 500 170MB	•999
ThinkPad 360 170MB/340MB	•1999/•2499
ThinkPad 360CS 170MB/340MB	•2599/•3099
ThinkPad 360C 170MB/340MB	•3499/•3999

NEW 3 Year Warranty on FLEX products in our inventory

FLEX PT60
Pentium™ Multimedia System

All For Only **$2995**

Now Includes COREL *CD POWER PAK* including
- Caching Software *Speeds up your CD ROM drive*
- System Browser *For CD ROM troubleshooting*
- Photo CD Lab *Edit photo image, crop, resize & transform photo CD images*
- CorelMOSAIC *Organize & view graphic and photo files*
- CD-Audio Software *Play your favorite music while you work / over your PC*

HEWLETT® PACKARD Authorized Dealer

★FLEX PT60 60MHz System
- Genuine Intel Pentium 60MHz Math Processor
- 256K Ultra-fast "Writeback" Cache Memory
- 8MB RAM, Maximum 128MB on System Board
- 3.5" (1.44MB) Floppy Drive
- 420MB IDE Hard Drive w/ 28K Cache
- 15" 28 NI SVGA 1024x768 *FLEXVISION* MultiScan Monitor

★Hewlett-Packard DeskJet 500C Printer

★SONY/Sound Blaster CD-ROM Bundle
- Sony Double-Spin Internal CD-ROM Drive,
- Creative Labs Sound Blaster 16 Audio Board,
- 16 CD-ROM Titles

★Microsoft Software and Accessories
- Microsoft DOS 6.0, Windows for Workgroups 3.11, Works for Windows
- FREE Accessories Kit

★24/96 Data/Fax Multimedia Modem

Create Your Own Multimedia

1 Choose Your CD-ROM Drive...

FLEX CD-PRO STARTER — Free CD included with either kit — FLEX CD-PRO CLASSIC $249 *CDPRO1*

$149 *CDPRO1*

CREATIVE SONY

Double Spin Internal CD-ROM drive with interface card and instructions • 32ms access time • 300K/sec transfer rate • multi-session Kodak PhotoCD Compatible

Sony Double Spin Int. drive
- 32ms access time
- 300K/sec transfer • 64Kb buffer
- Sound Blaster 16 Sound Card
- 16-bit stereo sampling & playback
- 20-voice • ASF and Wavetable upgradable, Speakers required

2 Choose Your CD-ROMs...
- 2 Free CD included with either Kit solid above PLUS Buy any 3 more CD-ROMs for only $49! (Ask your sales rep for selection of CD-ROM titles.)

3 Choose Your Speakers...
- Select from models by Sony, Jensen, Labtech, Altec Lansing, Panasonic & more!

Ask your Flex consultant for details about this Multimedia offer

PRINTERS

HEWLETT-PACKARD
HP DeskJet 520 - New 600 DPI	•285
HP DeskJet 500C - Color	•345
HP DeskJet 550C - Color	•429
HP DeskJet 560C - New Color	•559
HP DeskJet 1200C - Color	•1429
HP DeskJet 310 - Portable	•299
HP LaserJet 4L - New at Flex	•649
HP LaserJet 4P - New at Flex	•949

EPSON
ACTION LASER 1100/1500	•489/•649
ACTION LASER 1600	•944

DOT MATRIX PRINTERS
AP 2250	•124	LQ-1170	•598
LX300	•164	LQ-2550 Clr	•899
AP 3250	•162	DFX-5000	•1319
AP 3260	•177	DFX-8000	•2249
LQ-570+	•239	Stylus 300	•199
FX-870	•268	Stylus 400	•244
FX-1170	•349	Stylus 800+	•274
LQ-1070+	•364	Stylus 1000	•439
LQ-870	•439	Stylus Color	•558

PANASONIC
KX-P4410	•469	KX-P5400	•799
KX-P4400	•349	KX-P4440	•589
KX-P4430	•559		

DOT MATRIX PRINTERS
KX-P1150	•129	KX-P1624	•369
KX-P2023	•179	KX-P3123	•249
KX-P2123	•239	KX-P3124	•319
KX-P2124	•350	KX-P3624	•399

CANON
BUBBLE JET PRINTERS*
BJ-10SX / 20e / 230	•215/•254/•359
BJC-600	•535
LBP-430 / 860	•549/•1339

*Prices include '30 Rebate.

PRINTERS (cont.)

TEXAS INSTRUMENTS
microMarc™ Color	•239 / •379
microWriter	•509
microWriter PS23/PS65	•679/•799
microLaser Pro 600 PS23/PS65	•1359/•1529
Pro 600 imaging cartridge	•159

OKIDATA
OL400E	•499
OL410E	•679
Microline 320/321	•319/•439
Microline 590/591	•449/•599

MONITORS

NEC
14" SVGA	•293	17" 5FGe	•998
15" 3V	•469	17" 5FGp	•1094
15" 3FGe	•557	21" 6FGp	•1998
15" 4FGe	•617		

CTX
14" .39mm	•199
14" .28mm int./ E Star & MPR-II	•239/•249
14" .28mm NI/ E Star & MPR-II	•289/•295
15" .28mm int./.28 NI	•319/•339
17" .28 NI	•649

MAG Innovision
14" LX1450LG	•269
15" DX15F/MX15F-L	•369/•479
17" DX17F/MX17F-L	•669/•899
21" MX21FG	•1799

SONY
17" CPD-1730E/GDM-17E1	•969/•999
20" GDM20305	•1899
Universal MAC cable adaptor	•17.95

VIDEO CARDS

ATI Technologies
GRAPHICS ULTRA+ 2MB	•209
GRAPHICS ULTRA™ PRO 2MB ISA/VLB/EISA	•279/•279/•309

VIDEO CARDS

DIAMOND
SPEEDSTAR PRO 1MB ISA/VLB	•109/•109
SPEEDSTAR 64 ISA 1MB/2MB	•155/•199
STEALTH 32 VLB 1MB/2MB	•169/•209
STEALTH 64 VLB 2MB/4MB	•329/•469
VIPER 2MB VLB/PCI	•339/•359

HERCULES
Dynamite Pro ISA 1MB/2MB	•159/•199
Dynamite Pro VLB 1MB/2MB	•159/•189
Dynamite Power 2MB VLB/PCI	•209/•209
Graphite Power ISA 1MB/2MB	•229/•349
Graphite Power VLB 1MB/2MB	•199/•289

ORCHID
Fahrenheit 1280+ ISA 1MB	•139
Fahrenheit 1280+ VLB 1MB/2MB	•159/•199
KELVIN 64 1MB ISA/VLB/PCI	•175
KELVIN 64 2MB ISA/VLB/PCI	•225

MODEMS

HAYES
	Int./Ext.
PCMCIA Optima 144 + Fax	•289
ACCURA 24	•159/•269
ACCURA 144+fax/144	•115/•139
Optima 144+ fax/144	•369/•379
Optima 144+ fax Pocket Ed.	•299

US ROBOTICS
	Int./Ext.
PCMCIA World Port 14,400 FAX	•199
Sportster 14.4 FAX	•125/•145
World Port 14,400 FAX/Data Pocket	•199
Courier V.Fast 28.8k data/14.4 fax	•469/•549

BOCA
	Int./Ext.
2400 data, 96/48 S/R Fax	•99/•159
2400 data, 96/96 S/R Fax	•75/•95
14.4K with Fax	•89/•115
Pocket 2400 Data/Fax	•99
Pocket 14.4K with Fax	•169

NOTEBOOKS

SHARP
PC866GT-3495 Dual-scan color, 200MB/2399	
PC8650-II-2799 Active-matrix color, 200MB - 3999	

NOTEBOOKS

EPSON
ActionNote 4SLC2-50 120MB W/Modem	•1430
ActionNote 4SLC2-50 180MB	•1429
ActionNote 4SLC2-50 180MB W/Modem	•1529
ActionNote 500C 180MB W/Modem	•1999
ActionNote 700 120MB/210MB	•1659/•1929
ActionNote 700Ce 210MB	•1549
ActionNote 700Cx 210MB	•2199

TOSHIBA
T1910/1910CS 200MB	•1459/•1599
T1950CS 200 MB	•2273
T1950CT 200 MB/320MB	•2878/•3149
T3400 200MB	•1919
T3400/T3400CT 120MB	•1689/•2749
T4700CS 200MB/320MB	•3049/•3149
T4700CT 200MB/320MB	•4439/•4769
T6400 120MB	•1489
T6600C, C/CD	•2129/•2599

TEXAS INSTRUMENTS
TravelMate 4000E WinSX/25 Mono 120MB	•1729
WinDX2/40 Pass. Color 200MB	•2878
WinDX2/50 Dual Scan Color 200MB	•2919
WinDX2/50 Act. Matrix Color 200MB	•2899
WinDX2/75 8.4" Active Matrix Color 340MB	•3949
WinDX2/75 9.5" Active Matrix Color 455MB	•4499
TM4000 M Mono 120MB HD	•1549
TM4000 M Active Matrix Color 200MB HD	•2539
TM4000 M Adv. Pass. Color 120MB HD	•2099
TM4000 M Active Matrix Color 340MB HD	•3399
TM4000 M Active Matrix Color 344MB HD	•4899

USA★FLEX

Code # PC9004

1-800-723-6034

USA Flex, Inc. 471 Brighton Drive, Bloomingdale, IL 60108

No Surcharge On These Credit Cards

Circle 202 on reader service card.

COMPUTER DISCOUNT WAREHOUSE™

CDW CIRCLE OF SERVICE

ANOTHER FACT ABOUT COMPUTER DISCOUNT WAREHOUSE™

FACT: ***FREE*** technical support is available to **CDW®** customers.

BENEFIT: You will receive help from the best trained technicians in the industry — Just call 800 383-4239.

COMPUTER DISCOUNT WAREHOUSE™

WHY PAY RETAIL? CDW® SELLS SOFTWARE FOR LESS!

Adobe Illustrator V4.0 Win	441.82
Adobe Photoshop V2 5 1 Win	565 75
Aldus Freehand V3 1 Win	372 36
Aldus Pagemaker V5.0 Win	554.66
Aldus Pagemaker V5.0 Win upg	129 55
Aldus Type Twister V1 0 Win	28 99
Arabesque ECCO Pro V1 1 Win	247.55
Arabesque ECCO Simplicity V2 0	63 94
Autodesk AutoCAD LT V1 0 Win	411 06
Autodesk Autosketch V2 0 Win	162.09
Aventos Manage Pro V2 0 Win	207.70

Lotus Approach V3.0 for Windows™
ONLY $98.56
43508

Banner Blue ORG+ Adv V2 0 Win	116.85
Berkeley After Dark Win	29.01
Berkeley After Derk-Star Trek Win	29.14
Berkeley Disney Screen Svr Win	29 20
Berkeley More After Oark Win	27 06
Borland C++ V4 0	329 33
Borlend dBASE IV V2 0 DOS	519.78
Borlend dBASE IV V2 0 DOS LIC	279 62
Borland dBASE IV V2 0 DOS UPG	92 80
Borland dBASE V5 0 DOS	524.12
Borland dBASE V5 0 DOS vers upg	143.92
Borland dBASE V5 0 Win	327.09
Borland dBASE V5 0 Win upg	191 53
Borland Paradox V4 5 DOS	524 30
Borland Peradox V4 5 DOS upg	134 62
Borlend Paradox V4 5 Win	134.46
Borland Ouattro Pro V5 0 DOS	49 95
Borland Ouattro Pro V5.0 Win	39 95
Borland ReportSmith V2 0 Win	93 39
Borland Sidekick V1 0 Win	31 44
Borland Turbo C++ V3 0	66 04
Borland Turbo C++ Win visual ed	73.78
Borlend Turbo Pascal V1 5 Win	98.77
Borlend Turbo Pascal V7 0 DOS	99.10
Broderbund Automap Win	47.13
Broderbund Printshop Dlx V1 2 Win	48 22
Carmen Sendiego/World Dlx CD	55.28
CNN Time Capsule 1993 Win CO	27 16
Caere OmniPege Pro V5 0 Win	439.15
Caere PageKeeper V1 1 Win	356 46
Caere Personal PageKeeper V1 2 Win	97.17
Calera WordScan Plus V3 0 Win	381.24
Colorado Backup V1 1 Win	37.51
CA Clipper V5 2	477.46
CA Clipper V5 2 comp upg	122 75
CA Clipper V5.2 vers upg	104 42
CA Realizer V2 0 Win	71.70

MICROSOFT MS-DOS® V6.22 Upgrade
ONLY $49.74
42994

CA SuperCelc V5 5	97.28
Corel CD Power Pack w/headphones	37 39
Corel Gallery V1 0 Win CD	34.93
CorelDRAW V3 0	128 33
CorelDRAW V3 0 CO only	96 56
CorelDRAW V3 0 to V5 0 upg CD only	305 16
CorelDRAW V4 0	363.47
CorelDRAW V4 0 COonly	249 22
CorelDRAW V4 0 to V5 0 upg	214.38
CorelDRAW V4 0 to V5 0 upg CD only	174.07
CorelDRAW V5 0	567.42
CorelDRAW V5 0 CD only	433 82
CorelSCSI V2 0	82 21
CompuServe Member Kit Win	26 49
Claris FileMaker Pro V2 1 Win	116 63
Claris Works V1 0 Win	91.34
Oanana WinSleuth Gold+	59.38
OCA Crosstalk V2 1 Win	95.62
Delrina Communications Suite V2 0 Win	106.55
Delrine WinFAX Pro Network	238.10
Delrina WinFAX PRO V4 0	79.34
DeLorme MapExpert Win	248.12
Farellon Timbuktu V1 0 Win	127.76
Fractal Oesign Dabbler V1 0 Win	59.38
Fractal Design Painter V2 0 Win	243.65
Frame Tech Framemaker V4 0 Win	562.98
Generic CADD V6 1 DOS	236.10
HP Dashboerd V2 0 Win	46.26
Hayes Smertcom V1 0 Win	44 75
Helix Netroom V3 0 DOS	56 60
IBM OS/2 for Windows V2.1	51.15
IBM OS/2 for Windows V2 1 CO	39 18
IBM OS/2 V2 1	142.49
IBM OS/2 V2 1 UPG	112.14
IBM PC-DOS V6 3 UPG	49.66
Inset Systems Hijaak Pro V2 0 Win	78.21
Intuit Ouickbooks V2 0 Win	94.69
Intuit Ouickbooks/Ouickpay V2.0 DOS	125.37
Intuit Ouicken Companion V2 0	28 69
Intuit Ouicken V3 0 Win	43.22
Intuit Ouicken V7 0 DOS	44.14
Intuit OuickPay V3 0 DOS/Win	47.36
LaserTools Print Cache	47 00

MICROSOFT Office Professional V4.3 for Windows™ Upgrade
ONLY $351.00
39330

Lendmerk WinProbe V2 01A	41.41
Lotus 1-2-3 V2 4 DOS	321.54
Lotus 1-2-3 V2 4 DOS node	296 73
Lotus 1-2-3 V2 4 DOS upg	94.77
Lotus 1-2-3 V3 4A OOS sarver	395.42
Lotus 1-2-3 V3 4A OOS upg	95 11
Lotus 1-2-3 V4 01 + Organizer Win	344.37
Lotus 1-2-3 V4 01 + Organizer Win upg	107.78
Lotus 1-2-3 V4 01 Win	293 07
Lotus 1-2-3 V4 01 Win license	233 96
Lotus 1-2-3 V4 01 Win upg	93 97
Lotus Ami Pro V3 01 Win	249.22
Lotus Ami Pro V3 01 Win superbundle	226.70
Lotus Ami Pro V3 01 Win upg	95 04
Lotus Approach V3 0 Win	98 56
Lotus cc Mail Desktop V2 03 Win	66.09
Lotus cc Mail Desktop V4 02 OOS	66 22
Lotus cc Mail Mobile V2 0 Win	127.70
Lotus cc Mail Router V5 1	198 24
Lotus Freelance V2 01 Win	321.54
Lotus Freelance V2 01 Win upg	93 97
Lotus Improv V2 1 Win	96.48
Lotus Notes Client V3 0 Win	403 25
Lotus Notes Starter Pack V3 0 Win	805 15
Lotus Organizer V1 1 Win	91.34
Lotus ScreenCam V1 0 Win	52.73
Lotus SmartSuite V2 1 Win	446 39
Lotus SmartSuite V2 1 Win upg	289 17
LucasArts Rebel Assault	45 91
Mathsoft MathCAD V5 0 Win	89.74
McAfee VirusScan V1 5 Win	76 49
Microcom Carbon Copy V2 5 Win	102.78
Microcom Carbon Copy V6 1 OOS	124.87
MECA Managing Your Money V10 0	35.56
Procomm Plus V1 02 Win	93.17
Procomm Plus V2.01 DOS	67 60
Micrografx ABC Flowcharter V2 0 Win	179 86
Micrografx Draw V1 0 Win	47 96
Microhelp Uninstaller V2 0 Win	39.20
Microsoft Access V2 0 Win	294 42
Microsoft Access V2.0 Win dev kit	299.00
Microsoft Access V2 0 Win upg	114.01
Microsoft Arcade V1 0 Win	27.63
Microsoft Bookshelf 1994 CD	59.94
Microsoft Cinemania 1994 CD	52.00
Microsoft Complete Baseball 1994 Win CO	53.69

WordPerfect V6.0a for Windows
The Perfect Upgrade
ONLY $69.94
41608

Microsoft Creative Writer V1 0 Win	43.46
Microsoft Oinosaurs CD	51.96
Microsoft Electronic Forms Design V1 0 Win	234 93
Microsoft Encarta 1994 CD	63 34
Microsoft Excel V5 0 Win	294.42
Microsoft Excel V5 0 Win comp upg	113 62
Microsoft Excel V5 0 Win vers upg	89 52
Microsoft Fine Artist V1.0 Win	42.28
Microsoft Flight Simulator V5 0 OOS	42.26
Microsoft FORTRAN V5 1	146 22
Microsoft FoxPro V2 6 DOS	89.52
Microsoft FoxPro V2 6 DOS dist kit upg	23.20
Microsoft FoxPro V2.6 DOS upg	24 84
Microsoft FoxPro V2 6 Pro DOS	412 97
Microsoft FoxPro V2 6 Pro DOS upg	259 95
Microsoft FoxPro V2 6 Pro Win	411 59
Microsoft FoxPro V2 6 Pro Win upg	259.89
Microsoft FoxPro V2.6 Win	89 52
Microsoft FoxPro V2 6 Win dist kit upg	23.66
Microsoft FoxPro V2.6 Win upg	23.37
Microsoft Golf V1 0 Win	43.12
Microsoft Money V3 0 Win	27.61
Microsoft MS-OOS V6 22 step-up	9.95
Microsoft MS-OOS V6 22 upg	49.74
Microsoft MS-OOS V6 22 upg 3pk	112.12
Microsoft Multimedie Beethoven CO	52.59
Microsoft Multimedia Golf CD	42 26
Microsoft Musical Instruments CO	52.05
Microsoft Office Pro V4 3 Win	533 67
Microsoft Office Pro V4 3 Win CD	445.22
Microsoft Office Pro V4 3 Win upg	351.00
Microsoft Office V4 2 Win	445 22
Microsoft Office V4 2 Win license	379 29
Microsoft Office V4 2 Win upg	263 48
Microsoft PowerPoint V4 0 Win	294 28
Microsoft PowerPoint V4 0 Win upg	115.72
Microsoft Profit V1 0 Win	118 73
Microsoft Project V4 0 Win	412.97
Microsoft Project V4 0 Win vers upg	131 67
Microsoft Publisher V2 0 Win	85 51
Microsoft Publisher V2.0 Win design pk	34 54
Microsoft Schedule+ V1 0 Win starter kit	116.33
Microsoft Testing Tools for Windows V2 0	296 78
Microsoft TrueType Font Pack	45 53
Microsoft Visual Besic Pro V3 0 Win	294 42
Microsoft Visual Basic Pro V3.0 Win comp upg	175 26
Microsoft Visual Basic V3 0 Win	118 62
Microsoft Visual Basic V3.0 Win comp upg	69 52
Microsoft Visual Basic V3 0 Win vers upg	48 11
Microsoft Visual C++ Pro V1 5 CD	355 90
Microsoft Visual C++ V1 0 Win	72 62
Microsoft Visual C++ Windows NT	355 93
Microsoft Windows NT V3 1	294 39
Microsoft Windows NT V3 1 adv server	883.73
Microsoft Windows NT V3 1 upg	259.93
Microsoft Windows V3 11	89 50
Microsoft Windows V3 11 license	76 14
Microsoft Windows V3 11 upg	49.97
Microsoft Windows/Wrkgroups V3 11	131.21
Microsoft Windows/Wrkgroups V3 11 add-on	45.54
Microsoft Word V6 0 DOS	294.42
Microsoft Word V6 0 DOS vers upg	113 82
Microsoft Word V6 0 Win	295 96
Microsoft Word V6 0 Win upg	114 01
Microsoft Word V6 0 Win vers upg	97.30
Microsoft Works V3 0 OOS	91 62
Microsoft Works V3 0 Win	85.63
Moon Valley Icon Hear-It	11.97
Maxis SimCity 2000 OOS	41.04
Maxis Wrath of the Gods	43.47
Norton Lambert Close-Up V6 0	115.37
Pafton&Patton Flowcharting 4 Win	162.91
Peachtree Accounting V2 0 Win	104.21
Peachtree Complete Accounting V7 0 DOS	173.74
Persoft Smarterm 420 V3 0 Win	161.83
Oualitas 386MAX V7 0 DOS	58.23
Ouarterdeck DESOVIEW 386 V2 8	91.10
Ouarterdeck Desqview V2 0 Win	164.04
Ouarterdeck OEMM V7.0 3	69 38
Ouarterdeck OEMM V7 0 3 UPG	39.58
Ouerterdeck OEMM V7 0 3 w/game bundle	65.99
Ouarterdeck SideBar V1 0 Win	35.93
Ouark OuarkXPress V3.3 Win	603.47
SPC Harvard Graphics V2 0 Win	197.39
SPC Harvard Graphics V2 0 Win upg	73.92
SPC Harvard Graphics V3 06 DOS	339 00
Saber LAN Workstation V5 0	135 58
Saber LAN Workstation V5 0 node	36.56
ShepeWare Visio Express for MS Office	49.56
Shapeware Visio V2 0 Win	115.22
Spinnaker Calendar Creator V2.0 Win	38.96
Stacker V4 0 speciel upg	49.53
Stacker V4 0 Win/OOS	91.57
Symantec ACT V2 0 Win	172 63
Symantec ACT V2 1 DOS	246 65
Symantec Oirect Access V1 0 Win	62 79
Symantec Direct Access V5 1 DOS	63 36
Symantec Norton Anti Virus V3 0 DOS/Win	79.92
Symantec Norton Backup V3 0 Win	94.20
Symantec Norton Desktop V3 0 Win	109 24
Symantec Norton Utilities V8 0 DOS/Win	108.84
Symantec PC Tools V2 0 Win	87.91
Symantec PC Tools V9.0 OOS	88.49
Symentec pcAnywhere V1 0 Win	123.30
Symantec pcAnywhere V5 0 DOS	109.74

Symantec® pc ANYWHERE™ V1.0 for Windows™
ONLY $123.30
27994

Symantec pcAnywhere V5 0 DOS remote	81 08
Symantec O&A V4 0 OOS	249 72
Symentec O&A V4.0 Win	149 64
Symentec O&A V4.0 Win comp upg	91.34
Symantec XTree Gold V3 0 OOS	93.56
Symantec XTree V2 0 Win	91.38
Timeslips V5 1 DOS	179.30
Timeslips V5 1 Win	179.97
Touchstone Check It Pro Set	79 38
Traveling SW Laplink V V5 0 DOS	85 21
Virgin 7th Guest CD	48 56
WordPerfect InfoCentral V1 0 Win	88 99
WordPerfect Informs Dasignar/Filler V1 0	279.82
WordPerfect V5 1+ DOS	279.83
WordPerfect V6.0a Win	208.80
WordPerfect V6 0a Win license	211.60
WordPerfect V8 0a Win perfect upg	89 94
WordPerfect V6 0b DOS	249 86
WordPerfect V6.0b DOS license	182.89
WordPerfect V6 0b DOS perfect upg	89 34

CDW® HOURS
Sales:7:00-9:00 CDT Mon-Fri. / 9:00-6:00 CDT Sat.
TECH SUPPORT
8:00-7:00 CDT Mon-Fri. / 9:00-6:00 CDT Sat.
(800)383-4239

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 0.35% (0.0035) of the order total. Packaging materials will not exceed $4.00 per 1 package order or $8.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ Trademarks of all companies listed in this ad.

PCC1017

WE SELL NAME BRAND ITEMS FOR LESS!

(800) 886-4CDW

FAX (708) 465-6800

NASDAQ
CDW® is a NASDAQ traded company
TICKER SYMBOL CDWC
D & B Rated 4A1 Duns 10-762-7952

Turn the Page For More CDW® Savings.

No Surcharge For Credit Cards

High Volume Bids Invited

©1994 **CDW®** Computer Centers, Inc

Circle 131 on reader service card.

COMPUTER DISCOUNT WAREHOUSE™

COMPUTER DISCOUNT WAREHOUSE™

IBM ThinkPad® 500

50MHz subnotebook

SUMMER SIZZLER

- ✔ 486SLC2 50/25 Mhz CPU
- ✔ 4MB RAM Std., 12MB Max.
- ✔ 85MB or 170MB hard drive
- ✔ 1) Type II PCMCIA slot
- ✔ Keyboard-integrated TrackPoint II pointing device
- ✔ One year international warranty, 24 hr./7 day toll-free assistance

SAVE UP TO $700

ThinkPad 500 w/85MB HD ONLY! **$799.00** CDW 39402

ThinkPad 500 w/85MB HD ONLY! **$999.00** CDW 33722

Supplies are limited...call you CDW account axecutive today!

WHY PAY RETAIL?

CDW® Sells For Less

NEW

AST Authorized Systems Reseller

AST Advantage!

100MHz desktop computer

- ◆ IntelDX4™ 100MHz CPU ◆ 8MB RAM standard
- ◆ 540MB IDE hard drive ◆ 1MB video RAM
- ◆ Internal 9600 bps voice/data/fax modem
- ◆ Software bundle: MS-DOS, Windows, Lotus 1-2-3, Ami Pro and Organizer, Phoenix Fax, Prodigy and America On-Line and more

Special Purchase!........**$1879.85** CDW 43675

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

NETWORKING PRODUCTS

NOVELL

Netware V4.01

5 USER CD	778 57
10 USER CD	1765.90
25 USER CD	2588 41
50 USER CD	3461.67

Netware V3.12

5 USER 3 5"	577.73
10 USER 3 5"	1297 55
25 USER 3 5"	1898 00
50 USER 3 5"	2578 00
100 USER 3 5"	3698.00

Call lor Pricing on NetWere CD-ROM Versions and Upgrades

PERSONAL NETWARE V1.0 NEW

1 USER	59.88
5 USER	259.52

NOVELL PRICING IS SUBJECT TO CHANGE PLEASE CALL CDW FOR THE MOST CURRENT PRICING

THOMAS•CONRAD

TC5143 Ethernat coax	116.47
TC5143 Ethernet coax 8pk	667.25
TC5143 Ethernet 10BT	89.95
TC5143 Ethernet 10BT 6pk	469 88
TC6242 ARCNET 8-bit coax	66.86
TC6245 ARCNET coax	179.99
TC6242 ARCNET+ TP	95 94
TC6040 ARCNET passive 4 port hub coax	39.50
TC5055 Ethernet 8 port hub 10BT	339.47
TC4045 Tokan Ring 16/4	309.33

CDW Carries the Complete Line of TCNS Products Call for Details!

ARTISOFT

NodeRunner 2000A	215.58
NodeRunner 2000T	189.05
NodeRunner 2000C	169 05
NodeRunner/SI 2000A	93 50
NodeRunner/SI 2000T	76.70
NodeRunner/SI 2000C	76.70
LANtastic V6.0	79.50
LANtastic V6.0 5 user	322.90
LANtastic V6.0 Sterter Kit	299.00
Centrel Station II	389.13
10BT 5 port internal hub	256.72
NodeRunner starter kit-WIN	479 29
Simply LANtestic sterter kit	193 67
Simply LANtastic V1 0	54 89
T-Runner 8 port 10BT	293.92
T-Runner 12 port 10BT	488.41

SMC

Ultra18 ETHERNET COAX	105.25
Ultra16 COAX 6PK	576.75
Ultre16 COAX 24PK	2206 96
Ultre16 ETHERNET 10BT	105.25
Ultre16 10BT 6PK	534 20
Ultra16 10BT 24PK	1857 28
Ultre18 ETHERNET COMBO	119 35
Ultra16 COMBO 6PK	639.21
Ultre16 COMBO 24PK	2252.32
EtherCard+ ELITE COAX	119.64
EtherCerd+ ELITE COAX 8PK	628.73
EtherCard+ ELITE MCA COAX	189.26
EtherCerd+ ELITE 10BT	119 12
EtherCard+ ELITE 10BT 6PK	618 61
EtherCerd+ ELITE MCA 10BT	181.57
EtherCard+ ELITE EISA 10BT	579 78
EtherCard+ ELITE COMBO	139 57
EtherCerd+ ELITE COMBO 6PK	753 59
3608 Ethernet 8 PORT CON 10BT	298 85
3512 Ethernet 12+2 port hub 10BT	548 55
PC600WS ARCNET coax	119.93
PC650WS ARCNET TP	119.88
PC600FS ARCNET coax	199.29
PC130 ARCNET coex	68 50
ARCNET 8 port active hub coax	229.41
TokenCard Elite 16/4	249.88

3Com

3C503 Etherlink II coax	159.44
3C509 Etherlink III coax	115.50
3C509 Etherlink III coax 5 pk	489.02
3C509 Etherlink III 10BT	115.50
3C509 Etherlink III 10BT 5 pk	442.38
3C509 Etherlink III combo	132.73
3C509 Etherlink III combo 5 pk	532 84
3C579 Etherlink EISA coax	229 91
3C579 Etherlink EISA 10BT	229 91
3C1627 12 port Linkbuilder 10BT	838 95

NETWORKING PRODUCTS

OTHER TOP-QUALITY NAME BRANDS

Eagle NE2000+ coax	85.20
Eagle NE2000+ 10BT	77.31
Eagle NE3200 coax w/TPA	453.83
National Semi NE2000+ coax	78.24
National Semi NE2000+ 10BT	71.35

II You Don t See What You Are Looking For, Call CDW Carries the Best Networking Selection in the Industry!

Xircom

PE310BC pocket Ethernet coax	309.89
PE310B2 pocket Ethernet coax	267 80
PE310BT pocket Ethernet 10BT	268 31
PA202B6 pocket ARCNET coax	229 30
Pocket Token Ring III	455 89
PPX03 Parallei port multiplexor	77.80
14 4K bps pocket modem	459.74

IBM TOKEN RING

IBM Token Ring 16/4 ISA	422 03
IBM Token Ring 16/4 MCA	489 56
IBM Tokan Ring MAU	458 88

intel

EtherExpress 16 coex	99.33
EtherExpress 18 coax 5pk	454.13
EtherExpress 16 coax 20pk	1898 38
EtherExpress MCA coax	166.52
EtherExpress 16 10BT	99.33
EtherExpress 16 10BT 5pk	454.13
EtherExpress 16 10BT 20pk	1898.38
EtherExpress MCA 10BT	166.52
EtherExpress 16 combo	116.77
EtherExpress 16 combo 5pk	549.72
EtherExpress 16 combo 20pk	2036 93
EtherExpress FLASH 10BT	111.88
EtherExpress FLASH 10BT 5pk	515 82
EtherExpress FLASH combo	129.79
EtherExpress FLASH combo 5pk	599.00
EtherExpress EISA coax	409 88
TokenExpress 16/4.	349.94
NetportExpress II COAX	368.85
NetportExpress II 10BT	368 85
EtherExpress ISA hub	519.93
EtherExpress ISA hub exp	449.96

TAPE, REMOVABLE & FLOPPY DRIVES

COLORADO MEMORY SYSTEMS INC.

Jumbo 120MB internel	99 80
Jumbo 250MB internal	174.34
Trekker 120MB parallel port	209 90
Trakker 250MB parallel port	344.40
Powertape 2 4GB SCSI internal	937 58
Powertape 2 4GB SCSI external	1077 99
PowerDAT 4GB SCSI internal	1127.79

I-MEGA

Tape 250MB internal	169.57
Flopticel 21MB internal	379 27
Bernoulli90MB PC Powered Pro	298.49
Bernoulli150MB internal SCSI	479 11
Bernoulli 150MB internal IDE	469.59
Bernoulli 150MB PC Powered	494 76
Bernoulli 150MB Transportable	568 26
90MB cartridge	89 27
150MB cartridge	92.80

MICROSOLUTIONS

Backpack 3 5" 1 44MB floppy parallel	153.40
Backpack 5 25" 1 2MB floppy parallel	165.38
Backpack 340MB HD parallel	439 75
Backpeck 2X CD-ROM parallel	377.44
Backpack 250MB tape backup parallel	355.05

SyDOS

Pro Note 42MB parallel	418.17
Purna 88MB parallel	442.44
88MB w/16-bit adapter external	539 81
Purne 105MB parallel	514.94
Marlin 105MB IDE internal	478 28

TAPE, REMOVABLE & FLOPPY DRIVES

Mountain.

TD-250 250MB IDE internal	189 32
FS8500 305MB IDE internel	449.50
SidaCar II 305MB parallal	358 77
1200-4 4GB SCSI external	2045.39
750MB-1 5GB w/edapter external	1254 69

WYSE TERMINALS

Wyse 30 amber or green	272 89
Wyse 55 amber/green/white	223.21
Wyse 55 amber/green/white	229.83
Wyse 60 amber/green/white	279.60
Wyse 150 amber/green/white	265 45
Wyse 160 amber/green/white	329.88
Wyse 325 color.	427.40

MULTIMEDIA, SOUND, CD

Altec Lansing ACS300 speakers/subwoofer	239.69
Creative Labs Discovary 18 internal	328.88
Craative Labs SoundBlaster 16 AWE32	289 22
Creative Labs SoundBlaster Pro value edition	82 45
Creative Labs SoundBlaster 16 SCSI-2	148.09
Creative Labs SoundBlaster 16 ASP MCD	175.67
Diamond Sonic Sound basic	224 58
Diamond Sonic Sound LX	109.30
Media Magic 2X CD-ROM Kit internal	149 88
Media Magic DSP-16 System Internal	312 26
Media Magic ISP-16 System internal	284 10
Media Magic ISP-16 Sound Board	78 45
Microsoft Bookshell 1994 CD	65.79
Microsoft Cinemania 1994	52.88
Microsoft Windows Sound System	52.95
Microsoft Encarta 1894	85.24
Microsoft Multimedia Beethoven	52.88
Microsoft Windows Sound System w/board	138 10
Orchid GameWave 32	108 87
Orchid SoundWave 32	169 15
Sigma Designs ReelMagic Lite	291.30
Diamond Sonic Sound Pro upg kit	93.31
Sony Desktop Library w/sound external	479.54
Sony Desktop Library w/sound internal	467.73
Sony Desktop Library internal	235.05
Turtle Beach Monterey sound card	349.77
Video Logic 828Movie VLB 1MB	301.73

CD-ROM & OPTICAL DRIVES

CHINON CDS535 INT CD-ROM KIT	347.60
CHINON CDX535 EXT CDROM KIT.	427.88
Mitsumi FX-001D 2X int kit	148 40
NEC 3XI INTERNAL	439.37
NEC 3XE EXTERNAL	469.52
NEC 3Xp Portable	399.19
NEC 4X PRO	899.00
Orchid Soundwave/CD Multimedia KIT	355.52
Pioneer DRM804X 8 DISC Quadraspin	1109 50
PLEXTOR 3028 240MS INT KIT	309.42
PLEXTOR 5028 240MS EXT KIT	419.27
SONY CDU-33A Int 2X CD-ROM Kit	159.78
SONY CDU535 INT CD-ROM	274.72
SONY CDU55S 220ms Internal SCSI	228.38
SONY CDU7205N EXT CD-ROM	449.88
SYDOS PARALLEL PORT CD-ROM	289.49
Toshiba 3401 EXT SCSI CD-ROM	446.22
Toshiba 3401 EXT SCSI CD-ROM W/ADPT	567 50
Toshiba 3401 INT SCSI CD-ROM	317.60

PLOTTERS, DIGITIZERS & SCANNERS

KURTA

XGT 12X12 SER & ADB	213.96
XLP 12 X 18 16 BUTTON	438.93

CalComp

DB III 12X12 4 BUTTON	248.90
DB III 12X12 16 BUTTON	248 90
DB III 12X18 W/PRES PEN	399.85
DB III 12X18 16 BUTTON CORDLESS	896 85
SLATE 12X12 W/PRES PEN	383.40
SLATE 12X12 W/16 BUTTON	239.91

PLOTTERS, DIGITIZERS & SCANNERS

Canon

IX4015 COLOR SCANNER*	967 42

* *after $30 manufacturer rebate (ends 8/31/94)*

Summagraphics.

SUMMASKETCH III 12 X 12 18 BUTTON	253.90
SUMMASKETCH III 18 X 12 4 BUTTON	524 44

HOUSTON INSTRUMENT

HI 7100 A-D SIZE 8 PEN	2598 78
HI 7200 A-F SIZE 8 PEN	3387.22

HEWLETT PACKARD

HP SCANJET IIP	509.08
HP SCANJET IIP DOCUMENT FEEDER	269 93
HP SCANJET IICX W/ ISA	995 50
HP SCANJET IICX DOCUMENT FEEDER	474.72
IICX TRANSPARENCY ADAPT...	633.28

EPSON

ActionScanner ES600C	796 86
ActionScanner ES800C	1065 00
ActionScanner ES800C PRO	1238.53

VIDEO PRODUCTS

VGA & SUPER VGA MONITORS

Mag Innovision MX15F	479.86
Mag Innovision DX15F	382 31
Mag Innovision MX17F	809 79
Mag Innovision MX17FG.	839 14
Mag Innovision DX17F	698 00
Magnavox CM2089 14" 28	249 80
Magnavox CM2088 14" 28 NI	264 00
Magnavox CM4015 15"	358 85
Magnavox CM4017 17"	648 20
Magnavox 20CM64 20" SPECIAL!*	999 00

*while supplies last

Nanao F340iW 15"	859.00
Nanao F550i 17"	927 11
Nanao F550iW 17"	1029 00
NEC 2V 14" **	314 50
NEC 3V 15" **	427 49
NEC 3FGE 15"	557.17
NEC 4FGE 15"	617 19
NEC 5FGE 17"	999 50
NEC 5FGp 17"	1097 21
NEC 6FGp 21"	1997 00

** *after $25/$40 manufacturer rebate (ends 9/30/94)*

Philips Brilliance 17"	959 33
Philips Brilliance 21"	2239 45
Sony 15SF 15"	447.92
Sony CPD1730 17"	947 73
Sony 17SE 17"	969 88

VGA & SUPER VGA DISPLAY CARDS

ADS VGA TO TV ELITE	224.57
ATI Graphics Ultra+ 2MB	229 10
ATI Graphics Ultra Pro 2MB	284 22
ATI Graphics Ultra Pro 2MB EISA	394 92
ATI Graphics Ultra Pro 2MB VLB	284 25
CREATIVE LABS VIDEO SPIGOT	237 73
DIAMOND STEALTH 32 VLB 2MB	232 31
Diamond SpeedStar 64 ISA 1MB	185.85
DIAMOND SPEEDSTAR PRO 1MB	114 85
DIAMOND VIPER VLB 2MB	337 88
HERCULES DYNAMITE PRO VLB	159 33
HERCULES GRAPHITE POWER ISA 1MB	246 37
HERCULES GRAPHITE POWER ISA 2MB	363 12
INTEL SMART VIDEO RECORDER	369 80
Orchid Kelvin 64 ISA 1MB	182.98
Orchid Kelvin 64 ISA 2MB	226 38
Orchid Kelvin 64 VLB 1MB	149 83
Orchid Kelvin 64 VLB 2MB	194 18

If You Find a Better Price, Call CDW® Before You Buy (800) 886-4CDW

NASDAQ

BUY WITH CONFIDENCE CDW® IS A NASDAQ TRADED COMPANY

TICKER SYMBOL CDWC

D & B Rated 4A1

Duns 10-762-7952

No Surcharge For Credit Cards

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 0.35% (0.0035) of the enter total. Packaging materials will not exceed $4.00 per 1 package order or $6.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ Trademarks of all companies listed in this ad.

CDW® HOURS

Sales 7:00-9:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

Tech Support for Customers
8:00-7:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

MOST ORDERS SHIP THE SAME DAY

Free Product Information

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 433 RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

PCComputing
P.O. BOX 1689
RIVERTON, NJ 08077-9689

PCComputing FREE PRODUCT INFORMATION

Circle the numbers below corresponding to products featured in this issue's advertisements and listed in the Editorial Product Index. Manufacturers will mail product literature to you free of charge.

Void after December 31, 1994

PRODUCTS FEATURED IN ADVERTISEMENTS

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645
646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665
666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685
686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705
706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725
726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745
746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765
766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785
786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805
806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845
846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865
866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885
886	887	888	889	890	891	892	893	894	895	896	897	898	899	900					

Please answer questions below:

1. **Where do you use your computer?** (Check one only)
   A. ☐ Home B. ☐ Business C. ☐ Both
2. **What kinds of computers do you use?** (Check all that apply)
   D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F. ☐ MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply)

HARDWARE
G. ☐ PC
H. ☐ MAC
I. ☐ Laptop
J. ☐ Printer
K. ☐ Monitor
L. ☐ Disk/Tape Back-up
M. ☐ Add-in Board
N. ☐ Modem
O. ☐ Input Device
P. ☐ Local Area Network

SOFTWARE
Q. ☐ Accounting
R. ☐ Spreadsheet
S. ☐ Personal Finance
T. ☐ Desktop Publishing
U. ☐ Word Processor
V. ☐ Database Manager
W. ☐ Graphics
X. ☐ Utility
Y. ☐ Communications
Z. ☐ Windows/Multi-tasking
1. ☐ Programming Language Compiler
2. ☐ Integrated/Multifunction
3. ☐ CAD

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply)
   4. ☐ Specialty Computer Retail Stores
   5. ☐ Mail Order Firms
   6. ☐ Direct from Manufacturers
   7. ☐ Other

PCC 9/94-4

PLEASE PRINT CLEARLY

Name

Title Telephone

Company Name

Address

City State Zip

5. ☐ Please send me a one-year (12 issue) subscription to PC/Computing for $18.94 (U.S. price), all other countries add $16.00 for additional postage.

PC FREE PRODUCT INFORMATION

Circle the numbers below corresponding to products featured in this issue's advertisements and listed in the Editorial Product Index. Manufacturers will mail product literature to you free of charge.

Void after December 31, 1994

PRODUCTS FEATURED IN ADVERTISEMENTS

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	
616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	
631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	
646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	
691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	
706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	
736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	
766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	
796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	
811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	
856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	
871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	
886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	

Please answer questions below:

1. **Where do you use your computer?** (Check one only):
   A. ☐ Home B. ☐ Business C. ☐ Both
2. **What kinds of computers do you use?** (Check all that apply):
   D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F. ☐ MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply):

HARDWARE
G. ☐ PC
H. ☐ MAC
I. ☐ Laptop
J. ☐ Printer
K. ☐ Monitor
L. ☐ Disk/Tape Back-up
M. ☐ Add-in Board
N. ☐ Modem
O. ☐ Input Device
P. ☐ Local Area Network

SOFTWARE
Q. ☐ Accounting
R. ☐ Spreadsheet
S. ☐ Personal Finance
T. ☐ Desktop Publishing
U. ☐ Word Processor
V. ☐ Database Manager
W. ☐ Graphics
X. ☐ Utility
Y. ☐ Communications
Z. ☐ Windows/Multi-tasking
1. ☐ Programming Language/Compiler
2. ☐ Integrated/Multifunction
3. ☐ CAD

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply):
   4. ☐ Specialty Computer Retail Stores
   5. ☐ Mail Order Firms
   6. ☐ Direct from Manufacturers
   7. ☐ Other

PC9 9/94-4

PLEASE PRINT CLEARLY

Name

Title | Telephone

Company Name

Address

City | State | Zip

5. ☐ Please send me a one-year (12 issue) subscription to PC/Computing for $16.94. (U.S. price), all other countries add $16.00 for additional postage.

Free Product Information

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 433 RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

PC Computing
P.O. BOX 1689
RIVERTON, NJ 08077-9689

COMPUTER DISCOUNT WAREHOUSE™

CDW Circle of Service

NEC REBATE

MultiSync 2V 14" and 3V 15"
★ Flat square, non-glare CRT, .28mm dot pitch ★ Max. resolution 1024 x 768 N.I. ★ Refresh rate @ 1024 x 768: 2V, 70Hz; 3V, 60Hz ★ Up-front user controls, tilt/swivel base ★ 3 year warranty

NEC 2V™ .... **$314.50**[1] CDW 42741
NEC 3V™ .... **$427.49**[2] CDW 32663

1 includes $25.00 manufacturer rebate
2 includes $40.00 manufacturer rebate
(rebate ends 9/30/94)

WHY SETTLE FOR LESS?

CDW® SERVICES YOU BETTER

Megahertz
Linking Your Worlds

CDW's #1 PCMCIA

14,400 bps
PCMCIA FAX Modem with XJACK®

● Rugged XJACK® connector pops out for use and back in for travel ● XJACK® connector eliminates bulky cables and podules ● Auto installation ● Hot swappable ● Advanced Error Correction ● 5-year warranty

GOLD SERIES with Flash ROM and MNP 10

NEW LOW PRICE! **$229.00** CDW 37757

CDW® CARRIES OVER 15,000 PRODUCTS. IF YOU DON'T SEE IT, *CALL!*

COMPUTERS

TOSHIBA

T1910 200MB	1489.18	T1960CT 200MB	2996.98
T1910CS 200MB	1999.00	T1960CT 320MB	3289.91
T1950CT 200MB	2947.07	T3400CT 120MB	2889.90
T1950CT 320MB	3213.90	T3600CT 250MB	4095.14
T1960CS 200MB	2395.58		

T4700CS 200MB/320MB act color	3123.74/3389.38
T4700CT 200MB/320MB act color	4499.00/4849.00
T4800CT 500MB act color	5495.47
T6600C 510MB act color	8099.00
T6600C 510MB CD act color	8599.00

AST

Advantage! 4/100D 540MB 8MB	1879.85
Ascentia 4/50D 340MB pas color	3434.83
Ascentia 4/50D 340MB act color	4949.55
Ascentia 4/75D 340MB pas color	4045.22
Ascentia 4/75D 510MB act color	5908.73

BRAVO SERIES

LC 4/33S 170MB	1126.07	LC 4/66D 340MB CD	2334.60
LC 4/33S 270MB	1352.62	LC 4/100D 270MB	2212.18
LC 4/33D 170MB	1363.78	LC 4/100D 540MB	2499.99
LC 4/33D 270MB	1589.33	MT 4/66D 170MB	1774.71
LC 4/50S 170MB	1267.80	MT 4/66D 340MB	2222.02
LC 4/50S 270MB	1517.79	MT P60 270MB	2476.12
LC 4/66D 270MB	1858.18	MT P60 540MB CD	3301.87
LC 4/66D 540MB	2233.18		

Bravo NB 4/33S 200MB mono	1843.08
Bravo NB 4/33S 200MB pas color	2287.73

EPSON

ActionNote 4SLC50 120MB+modem	1442.05
ActionNote 4SLC50 180MB+modem	1534.75
ActionNote 500C 120MB+modem	1822.49
ActionNote 500C 180MB+modem	1873.99
ActionNote 700 120MB mono	1988.18
ActionNote 700C 120MB pas clr	2469.93
ActionNote 700C 210MB pas clr	2558.38
ActionNote 700CX 210MB act clr	3208.77

IBM ThinkPad Portables

500 4/50SLC2 85MB	799.00	350 250MB	1899.00
500 4/50SLC2 170MB	999.00	350C 120MB	1799.00
350 125MB	1499.00	350C 250MB	2199.00

PS/ValuePoint Systems

4/25SX Si 120MB	875.00	466D 364MB	2575.00
4/25SX Si 212MB	945.00	466D 527MB	2725.00
4/33DX Si 212MB	1269.00	466D 527MB	2835.00
4/66DX2 Si 212MB	1689.00	4100D 364MB	2839.00
Pentium 5/60 527MB	3319.00	PCI 4100D 527MB	3099.00

NEC
VERSA NOTEBOOKS

Versa S 433SX 210MB mono	1906.68
Versa S 4/33SX 210MB pas color	2333.00
Versa S 4/33SX 210MB act color	3298.80
Versa S 4/50DX2 260MB act color	3789.93
Versa E 4/40 120MB act color*	3339.50
Versa E 4/40 250MB act color*	3759.81
Versa E 4/50 209MB act color*	4031.78
Versa E 4/50 340MB act color*	4447.84
Versa E 4/75 340MB act color*	4799.28
Versa E 4/75 528MB act color	5199.08
Ready 433SX 270MB CD	1349.45
Ready 466DX 340MB CD	1899.85
Ready 466M 430MB 3X CD	1808.88
Ready 4100M 420MB 3X CD	2353.17
PowerMate 433SX 270MB	1119.32
PowerMate 466DX 420MB	1819.91
PowerMate 466MT 420MB	1559.89
PowerMate 4100MT 420MB	1969.50
Image 4100 210MB	2279.33
Image 4100 420MB	2414.80
Image 4100 420MB CD	3199.19

** Includes $200 manufacturer rebate (ends 7/31/94)*

PACKARD BELL

Force Multimedia 4/25 210MB	1083.92
Force 4/33SX 210MB	849.00
Force Multimedia 4/33SX 340MB	1338.58
Force Multimedia 4/50SX2 420MB	1549.47
Force Multimedia 4/66DX2 420MB	1979.28
Force Multimedia 5/60 420MB	2405.08
Force 4/50SX2 340MB	1178.39
Force 4/66DX2 420MB	1549.47
Force MT 4/66DX2 420MB	1729.70

TEXAS INSTRUMENTS

TM4000M 4/25 120MB mono	1899.98
TM4000M 4/25 120MB adv pas clr	2347.46
TM4000M 4/25 200MB act color	3197.17
TM4000M 4/75 344MB act color	4974.40
TM4000E 4/25 120MB adv pas clr	1749.48
TM4000E 4/50 200MB dual color	2389.51
TM4000E 4/50 200MB act color	2919.87
TM4000E 4/75 340MB act color	3888.80
TM4000E 4/75 455MB 9.5" act color	4538.64

COMPUTERS

Canon NoteJet notebooks

4/33 120MB mono	1922.37	4/33 200MB pas clr	2577.43
4/33 200MB mono	2014.39	4/50 130MB pas clr	2846.81
4/33 120MB pas clr.	2477.93	4/50 260MB pas clr.	3014.46

INNOVA NB 4/33S 120MB MONO	1298.57
INNOVA NB 4/33 170MB MONO	1388.48
INNOVA NB 4/33S 170MB PAS COL	1875.71
INNOVA NB 4/33S 260MB MONO	1458.40
INNOVA NB 4/33S 260MB PAS CLR	1959.07
INNOVA 4/50L 170MB	1329.58
INNOVA 4/50L 240MB	1408.98
INNOVA 4/66L 240MB	1814.88

DOT MATRIX & LASER PRINTERS

OKIDATA

184 TURBO	219.14	ML590	429.51
ML320	304.45	ML591	585.87
ML321	432.43	Pacemark 3410	1222.92
ML380	214.95	OL400E	499.98
ML395	989.32	OL410E	849.31
ML395C	1039.74	OL810	905.50
ML520	389.82	OL830+	1079.11
ML521	495.18	OL850 PS.	1199.20

Canon

BJ10SX*	214.88	BJC600 COLOR*	548.25
BJ200E*	259.00	LBP430 LASER*	558.50
BJ230*	358.00	800DPI 8PPM*	1288.57

** after $30 manufacturer rebate (ends 8/31/94)*

EPSON

AP2250	122.58	LQ2550	898.08
AP3250	181.51	DFX5000 Plus	1384.88
AP3260	181.43	DFX8000	2269.46
LX300	185.01	Stylus 300	199.54
FX870	287.59	Stylus 400	241.22
FX1170	354.95	Stylus 800	249.97
LQ570+	237.97	Stylus Color	859.70
LQ1070+	385.35	ActionLaser 1500	856.70
LQ870	444.91	ActionLaser 1600	933.83
LQ1170	809.93		

IBM LEXMARK LASER PRINTERS

4037 5E 5PPM	857.17
4029-10 10PPM	1115.42
4039-10R 10PPM	1299.46
4039-10RD 10PPM DUPLEX	1719.84
4039 16L PLUS	2775.03
4039 12L PLUS	1891.25
4039 12R PLUS	1409.78
WinWriter 600	1197.38

NEC

SuperScript 610	477.78
Silentwriter 840	734.60

Panasonic

1150	133.49	3123	249.00
1624	385.20	4410 Laser	547.15
2023	182.27	4430 Laser	688.91
2124	318.41	4440 Laser.	1019.78
2130	203.80	4400 Laser*	458.98
2135 Color	246.71	5400 Laser**	712.98
2624	409.49		

*after *$50 or **$100 manufacturer rebate (ends 9/30/94)*

TEXAS INSTRUMENTS

MICROMARC INKJET	243.75
MICROMARC COLOR INKJET	379.13
MICROWRITER BASIC	507.16
MICROWRITER PS23	677.22
MICROWRITER PS65	819.90
MICROLASER PRO 600 PS23	1355.20
MICROLASER PRO 600 PS65	1524.25
POWERSTEP UPG- mL600	274.88

SHARP PRINTERS

SHARP JX9400 300DPI 4PPM	477.09
SHARP JX9460PS 600DPI 6PPM	945.75

HEWLETT PACKARD

DeskJet PORTABLE 310 w/CSF	387.00
HP DeskJet 500C	388.20
HP DeskJet 520	289.00
HP DeskJet 560C	589.00
HP DeskJet 1200C	1449.81
HP DeskJet 1200C PS	2187.20
HP PaintJet XL300	2258.93
LaserJet 4L	679.58
LaserJet 4P	979.74
LaserJet 4MP	1469.88
LaserJet 4plus	1478.25
LaserJet 4M plus	1998.27
LaserJet 4SI	2998.95
LaserJet 4SI MX	4508.38

**while supplies last*

COSTAR

LabelWriter II DOS/Win	178.00
Address Express	329.00

HARD DRIVES & CONTROLLERS

Maxtor

170MB IDE	192.73	345MB SCSI	298.12
345MB IDE	289.52	540MB IDE	377.07

MICROPOLIS

2210A 1050MB IDE	778.18
2210 1050MB SCSI	808.38
4110 1050MB SCSI	759.50
2217 1.7GB SCSI	1038.41
2210AV 1.050GB SCSI AV	869.38
2217AV 1.765GB SCSI AV	1099.22
1936 3GB SCSI.	2098.00

CONNER

210MB IDE	199.09	426MB IDE	289.94
343MB IDE	259.51	1GB SCSI	779.45
343MB SCSI	283.28		

Seagate

130MB IDE	187.81	452MB IDE	331.18
200MB IDE	214.74	535MB SCSI-2	855.25
261MB IDE	237.80	1.0GB SCSI-2	734.57
341MB IDE	249.08	1.69GB SCSI-2	1597.21

WESTERN DIGITAL

Caviar 210MB IDE	209.48	Caviar 420MB IDE	271.01
Caviar 250MB IDE	237.71	Caviar 540MB IDE	361.69
Caviar 340MB IDE	243.10		

CONTROLLERS

ACCULOGIC IDE W/1PAR, 2SER, 1GAME	35.06
ACCULOGIC IDE W/BIOS	48.90
ACCULOGIC VLB IDE	89.78
ADAPTEC 1510A SCSI-2 CD KIT	89.86
ADAPTEC 1542CF SCSI-2	265.45
ADAPTEC 2742T EISA SCSI-2	339.22
ADAPTEC 2842 VLB SCSI-2	257.23
Promise IDE ISA Cache	99.88
Promise IDE VLB Cache	115.28

MODEMS & COMMUNICATIONS

U.S. Robotics
SPORTSTER MODEMS

28.8K w/fax internal	209.91	14.4K external	135.50
28.8K w/fax external	227.88	14.4K w/fax external	139.50
14.4K internal	118.59	Worldport 14.4K w/fax	236.09
14.4K w/fax internal	119.50		

COURIER MODEMS

V.34 Ready w/fax Internal	397.08
V.34 Ready w/fax external	432.82
V.34 Ready Dual Std. internal	826.92
V.34 Ready Dual Std. external	582.44

Hayes

ACCURA 14.4 + FAX14.4 INT	118.81
ACCURA 14.4 + FAX14.4 EXT	139.73
ACCURA 28.8K V.FC w/fax	259.31
OPTIMA 14.4 EXT	383.80
OPTIMA 14.4 + FAX14.4 EXT	374.30
OPTIMA 14.4 + FAX14.4 Pocket	298.93
OPTIMA 28.8 + FAX14.4 EXT	421.54
ULTRA 14.4 EXT	823.07

PRACTICAL PERIPHERALS

14.4K w/fax internal	107.38
14.4K w/fax Mini Tower	124.80
28.8K w/fax internal	228.20
28.8K w/fax Mini Tower	244.28

intel

SatisFAXtion 200 internal	209.50
SatisFAXtion 400 internal	278.33
SatisFAXtion 400 external	309.59
14.4K w/fax internal	119.00
14.4K w/fax external	139.50

BOCA

14.4K w/fax internal	89.00
14.4K w/fax external	113.81
28.8K w/fax internal	188.98
28.8K w/fax external	218.30

MICROCOM

Deskporte ES 14.4K	179.00
Deskporte Fast ES 28.8K	234.77
Deskporte Fast EP 28.8K	308.00

MOTOROLA

FasTalk II 14.4K w/fax internal	119.78
FasTalk II 14.4K w/fax external	139.84

BATTERY BACKUP AND UPS

AMERICAN POWER

BACK UPS 250	105.86	BACK UPS 1250	518.46
BACK UPS 400	168.25	SMART UPS 400	299.69
BACK UPS 450	189.71	SMART UPS 600	363.38
BACK UPS 600	275.60	SMART UPS 900	514.61
BACK UPS 900	374.15	SMART UPS 1250	644.24

SURGEARREST NETWORK NEW	34.97
SURGEARREST PRO NEW	33.58
SURGEARREST NETWORK + PHONE	48.85
LINE-R 600	119.09

BEST LITE

BC250	99.11	BC600 LAN	249.00
BC400	155.59	BC750 LAN	313.90
BC500	189.42	BC900 LAN	359.67
BC500 LAN	199.40	BC1250 LAN	459.10

Smart UPS SERIES NEW

SMART 250 LAN	232.46	SMART 900 LAN	463.83
SMART 400 LAN	279.22	SMART 1250 LAN	681.40
SMART 500 LAN	309.09	Isobar 4 OUTLET	38.95
SMART 600 LAN	323.49	Isobar 6 OUTLET	46.38
SMART 750 LAN	403.99		

PCMCIA

3Com Etherlink II combo	246.15
BOCA 14.4K DATA/FAX	209.45
DATARACE 14.4K W/FAX	238.24
DATARACE 2400 W/FAX	188.70
DSP Tech Portable Sound+	154.34
EAGLE NE200C ETHERNET COAX	238.45
EAGLE NE200T ETHERNET	208.49
IBM TOKEN RING 16/4	447.57
INTEL 9600 W/FAX	199.98
INTEL 14.4 W/FAX	209.38
INTEL 24/96 W/FAX	128.92
LINKSYS ETHERNET 10BT	175.15
LINKSYS ETHERNET COAX	175.15
MAXTOR MOBILEMAX 105MB HD	379.92
MEGAHERTZ 14.4 W/FAX	218.70
MEGAHERTZ GOLD 14.4 XJACK W/FAX	229.00
MEGAHERTZ 2400 XJACK W/FAX	98.60
MEGAHERTZ 9800 XJACK W/FAX	179.70
MINISTOR 42MB HARD DRV	298.25
Motorola 14.4K w/cellular	419.00
NAT SEMI NE4100T ETHERNET 10BT	172.98
T. CONRAD ETHERNET COAX	228.44
TRANTOR SLIM SCSI-2	279.45
TURTLE BEACH Audio Advantage	129.38
USR WORLDPORT 14.4 W/FAX	209.90
XIRCOM TOKEN RING ADAPTER	449.18
HAYES OPTIMA 14.4 W/FAX	287.70
XIRCOM ETHERNET 10BT	228.74
XIRCOM ETHERNET COAX	228.38
XIRCOM ETHERNET [illegible]	[illegible]

MEMORY UPGRADES

CDW® Features Delkin, Kingston, Pacific Data and Simple Technology Memory.

AST BRAVO 486LC 2MB	CALL!
AST POWEREXEC 486 4MB	CALL!
AST PREMIUM II 1MB CUPID SIMM	CALL!
AST PREMMIA 8MB UPG	CALL!
COMPAQ DESKTOPS-ALL MODELS	CALL!
COMPAQ CONTURA 486 8MB	CALL!
COMPAQ CONTURA 4MB	CALL!
COMPAQ LITE 4/25C 4MB	CALL!
EPSON ACTION LASER 2-8MB	CALL!
HP DESKJET 500 & 500C 256KB	CALL!
HP LASERJETS-ALL MODELS	CALL!
HP PAINTJET XL300 4MB	CALL!
IBM DESKTOPS-ALL MODELS	CALL!
IBM THINKPAD 700 4MB	CALL!
NEC SILENTWRITER 95 2MB	CALL!
NEC VERSA 4MB	CALL!
OKILASER 400 2MB	CALL!
OKILASER 800 2MB	CALL!
PANASONIC 4410, 4430 2-4MB	CALL!
PANASONIC P4450I 2MB	CALL!
TI MICROLASER 1MB	CALL!
TI TM4000 4MB	CALL!
TOSHIBA NOTEBOOKS-ALL MODELS	CALL!

Please Call CDW for the Best, Most Current Pricing and Availability Information.

PROCESSOR/UPGRADES

CYRIX 486DRX/2 Upg 40Mhz	247.44
INTEL DX2/50 OVERDRIVE	296.81
INTEL DX2/66 OVERDRIVE	332.05
KINGSTON SX/NOW 25MHZ	189.18
KINGSTON SX/NOW 33MHZ	196.25
KINGSTON 486/NOW 33MHz	255.52
KINGSTON 486/NOW 33MHZ	438.30

MATH COPROCESSORS

INTEL 387SX 16/20/25MHZ	78.84
INTEL 387SX 33MHZ	89.83
INTEL 387SL	76.22
INTEL 387DX	79.83

COMPUTER DISCOUNT WAREHOUSE™

CDW Computer Centers, Inc.
1020 E. Lake Cook Road
Buffalo Grove, IL 60089

CDW® Sells for Less and Services You Better!

(800) 886-4CDW

FAX (708) 465-6800

©1994 CDW® Computer Centers, Inc PCC1017

CALL FOR FREE CDW® CATALOG

Circle 34 on reader service card.

The Service You Remember

Call or write for your Free MidWest Micro catalog.

MidWest Micro

SYSTEMS
1-800-682-7248

PERIPHERALS
1-800-972-8822

Fill 'er Up

MidWest Micro has never forgotten what full service is all about. For more than a decade, we've been attending to you with premium products, the lowest prices and unbeatable customer service. And even though we hate to toot our own horn, we're proud of the awards we've driven away with over the years – including 14 Computer Shopper Best Buy Awards and PC Computing's Five Star Rating for outstanding service and support.

The Real Warranty – Not Just A Lot Of Hot Air

Tired of computer companies with flat, tread-bare warranties? Check out MidWest Micro's **Real Warranty** with three full years of bumper-to-bumper system coverage. The first company to offer such an extensive warranty, MidWest Micro completely covers your Elite Desktop System and all its components – even the monitor and hard drive.

Squeaky-Clean Guarantee

When you buy from MidWest Micro, you'll feel confident in your decision. That's because in addition to the Real Warranty, your Elite System is backed by a **30-Day Money-Back Guarantee.** When it comes to customer satisfaction, we don't miss a spot. And if your system ever *does* need a tune up, our **Immediate Parts Replacement Policy** will fix you right up.

Phone-Line Freeze Up?

Don't be afraid to call and ask for help – it's easy! MidWest Micro provides **Lifetime Toll-Free Technical Support** with your Elite purchases. Qualified technicians are standing by to answer all of your questions quickly and accurately. And for round-the-clock access to the latest drivers and utilities, pull up to our **On-Line Bulletin Board Service** and simply download the information you need.

We'll Pump You Up

You don't have to go back in time to get this kind of attention. At MidWest Micro, we'll even custom configure your Elite System with your choice of peripherals and one of five attractive case designs. Call today and take a nostalgia trip with MidWest Micro – your one-stop location for the latest technology and good old-fashioned service.

Circle 237 on reader service card.

Hot, Fast And To Order

Have it Your Way

Get ready for the hottest items on MidWest Micro's menu. Fast, fresh and topped with features, these Intel-based Elite Systems are just what you've been craving. And since everyone has different tastes, we'll configure your system the way *you* like it. Want extra RAM, a double-speed CD-ROM drive or a sound card?...no problem. Just place your order and we'll bring it right out to you.

Tonight's Special...

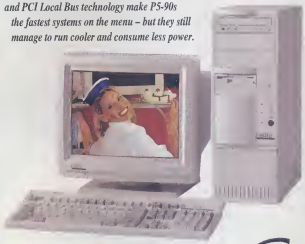
Feast your eyes on Elite's Pentium PCI Systems. These high-tech dishes feature sizzling processors and mouth-watering PCI bus architecture. And once the gang sees MidWest Micro's low prices on Pentium Systems, they'll never order "the usual" again. With PCI (Peripheral Component Interconnect) technology, your information is cruisin' on a fast 32-bit data path – perfect for full-motion video and peripheral expansion. Add a 60, 66 or 90 MHz Intel Pentium processor, and you've got more than enough power to go around.

Hungry For Value?

Try an Elite Slimline Value System. Each of these affordable Elites is served in an attractive Slimline case that conserves desktop space. You won't find a larger helping of features at such a low price. Our Elite VESA and PCI Systems will also whet your appetite with advanced local bus technology and plenty of high-tech toppings. Talk about fast food, these systems reach clock-doubling speeds up to 66 MHz! MidWest Micro is *your* high-performance hangout – call (or honk twice) for an Intel-based Elite System today.

"Yeah, give me a computer system with everything, a side order of RAM, a large hard drive—and make it fast!"

If you think a faster system that conserves energy is a tall order, you haven't seen MidWest Micro's Elite P5-90 Systems. Powerful 90 MHz processors and PCI Local Bus technology make P5-90s the fastest systems on the menu – but they still manage to run cooler and consume less power.



3 YEAR

WINDOWS FOR WORKGROUPS

Seagate

intel inside pentium PROCESSOR

Made

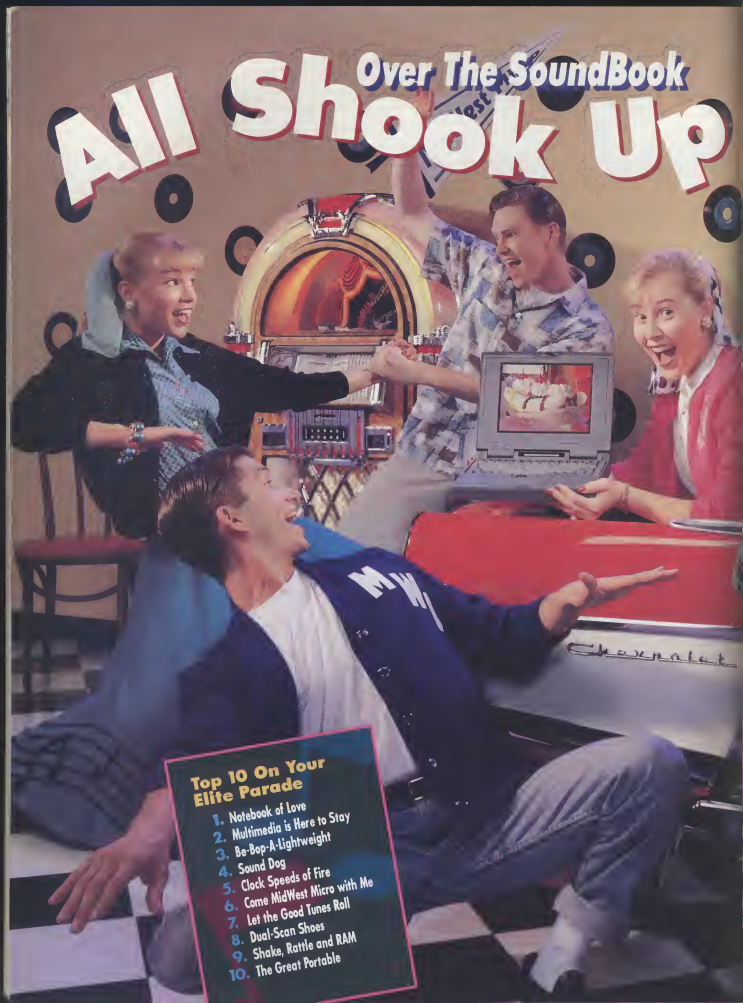
MidWest Micro

SYSTEMS
1-800-682-7248

PERIPHERALS
1-800-972-8822

Circle 271 on reader service card.

AD#M09


Over The SoundBook
All Shook Up
Top 10 On Your Elite Parade
1. Notebook of Love
2. Multimedia is Here to Stay
3. Be-Bop-A-Lightweight
4. Sound Dog
5. Clock Speeds of Fire
6. Come MidWest Micro with Me
7. Let the Good Tunes Roll
8. Dual-Scan Shoes
9. Shake, Rattle and RAM
10. The Great Portable

Yakety Yak—This Elite Talks Back

You don't have to drop coins in the Elite SoundBook to hear what it has to say – just listen. Complete with a built-in microphone and speaker, this high-performance notebook has enough audio power to wake up little Susie. It even comes with software that lets you record, store and playback voices, sounds or music. And since it features a powerful Intel processor, Advanced Power Management and lots of RAM-a-lam-a-ding-dong, Elite's mini jukebox is sure to be a hit at your next sock hop.

Whole Lotta Choices Goin' On

MidWest Micro knows that no two be-boppers are alike. That's why we offer a variety of SoundBook configurations with different screens, processors and hard drives. All you have to do is make your selection – maybe you'd like to hear E-7, a 486SX-33 monochrome SoundBook guaranteed to start your saddle shoes tapping. Or you may prefer J-5, a dual-scan DX4-100 with a 520 Mb hard drive and processing speeds faster than Elvis' Pelvis. Whether you're in the mood to Stroll, Jitterbug or La Bamba, we've got a SoundBook that's playing your song.

Video That Knocks Your Socks Off

The Elite SoundBook is also topping the charts with video performances in monochrome, dual-scan and active-matrix screens. For a little black and white with your rock and roll, try a monochrome SoundBook with crisp resolutions that score big on the Bandstand. Also a Billboard favorite, the large 10.3" dual-scan version uses affordable dual-scan color technology for less shadowing and sharper images. Choose an active-matrix screen, and you're sure to find your thrill with faster response times and a spectrum of vivid colors – from blues bluer than Blueberry Hill to purples fit for a flying people-eater. For audio and video in perfect harmony, call MidWest Micro and request your SoundBook today.

Not Quite Ready To Rock?

If you're looking for something with a little less volume, Elite's 486SX SubNote may be for you. Even though it can't play the top ten, this 3.9 lb. computer has plenty of other hit features such as a nickel-metal hydride battery, Advanced Power Management and your choice of dual-scan or monochrome screens.

intel inside

For portable computing that really rocks, check out the Elite SoundBook. Aside from its built-in microphone and speaker, this tiny vocalist features Local Bus video, a powerful nickel-metal hydride battery and plenty of configuration elements to choose from – including a 10.3" display, 520 Mb hard drive and processing speeds up to 100 MHz.

MidWest Micro

SYSTEMS
1-800-682-7248

PERIPHERALS
1-800-972-8822

AD#M09

Circle 273 on reader service card.

PENTIUM PCI SYSTEMS

P5-60 $1999
#008613
- Intel 60 MHz Pentium™ Processor
- 8 Mb RAM, 256 Kb Cache
- 428 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Double Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

P5-66 $2499
#008614
- Intel 66 MHz Pentium Processor
- 8 Mb RAM, 256 Kb Cache
- 428 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 2 Mb
- Double Speed CD-ROM Drive
- Microsoft 3 Disk CD-ROM Software Library – Encarta™, Works™ & Money™
- 16-Bit Stereo Sound Card
- Altec Lansing Digital Quality Speakers
- Internal 14.4 S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

P5-66 $2799
#008616
- Intel 66 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 2 Mb
- Double Speed CD-ROM Drive
- Internal 14.4 S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Middle-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

P5-90 $2999
#008617
- Intel 90 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 2 Mb
- Double Speed CD-ROM Drive
- Internal 14.4 S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Middle-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

P5-60 $2399
#008615

P5-90 $3499
#008618
- Intel 90 MHz Pentium™ Processor
- 16 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 2 Mb
- Double Speed CD-ROM Drive
- Internal 14.4 S/R Fax Modem
- 3.5" Disk Drive
- 17" .26 1600 x 1280 Exact Match Color Monitor
- 10-Bay Full-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

P5-90 $3999
#008619

With 1 Gb SCSI HDD and Internal 28.8 S/R Fax Modem

VESA AND PCI SYSTEMS

DX2-66 $1399
#008606
- Intel 486DX2-66 Processor
- 4 Mb RAM, 128 Kb Cache
- 340 Mb IDE Hard Drive
- 32-Bit VESA Local Bus Graphics w/1 Mb
- 32-Bit VESA Local Bus IDE
- 9624 Internal S/R Fax Modem
- 3.5" Disk Drive
- 14" SVGA .28 NI Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 5 ISA & 3 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works For Windows 3.0
- The Real 3 Year Warranty

SX-33 $1199
#008601

DX-33 $1359
#008604

DX2-50 $1359
#008605

DX2-66 $1799
#008609
- Intel 486DX2-66 Processor
- 8 Mb RAM, 128 Kb Cache
- 340 Mb IDE Hard Drive
- 32-Bit VESA Local Bus Graphics w/1 Mb
- 32-Bit VESA Local Bus IDE
- Double Speed CD-ROM Drive
- Internal 14.4 S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 5 ISA & 3 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

DX-33 $1759
#008607

DX2-50 $1759
#008608

DX2-66 PCI $1799
#008610
- Intel 486DX2-66 Processor
- 8 Mb RAM, 256 Kb Cache
- 340 Mb IDE Hard Drive
- PCI Local Bus Graphics with 1 Mb
- Double Speed CD-ROM Drive
- 3.5" Disk Drive
- 14" SVGA .28 NI Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 3 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

DX2-66 PCI $1999
#008612
- Intel 486DX2-66 Processor
- 8 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- PCI Local Bus Graphics with 1 Mb
- Double Speed CD-ROM Drive
- 9624 Internal S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 3 ISA, 2 PCI & 1 PCI/ISA Slots
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

DX-33 PCI $1979
#008611

EPA POLLUTION PREVENTER

SLIMLINE VALUE SYSTEMS

HOME PC $1499
#008601
- Intel 486SX-33 Processor
- 4 Mb RAM, 128 Kb Cache
- 340 Mb IDE Hard Drive
- 32-Bit Local Bus Graphics with 1 Mb
- 32-Bit Local Bus IDE
- Double Speed CD-ROM Drive
- Microsoft 3 Disk CD-ROM Software Library – Encarta™, Works™ & Money™
- 16-Bit Stereo Sound Card
- Digital Quality Speakers
- 9624 Internal S/R Fax Modem
- 3.5" Disk Drive
- 14" SVGA .28 NI Color Monitor with Hitachi CRT
- Slimline Case
- 4 ISA & 1 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

HOME PC $1999
#008602
- Intel 486DX2-66 Processor
- 8 Mb RAM, 128 Kb Cache
- 428 Mb IDE Hard Drive
- 32-Bit Local Bus Graphics with 1 Mb
- 32-Bit Local Bus IDE
- Double Speed CD-ROM Drive
- Microsoft 3 Disk CD-ROM Software Library – Encarta™, Works™ & Money™
- 16-Bit Stereo Sound Card
- Digital Quality Speakers
- 14.4 Internal S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA .28 NI Multi-Scan Color Monitor with Hitachi CRT
- Slimline Case
- 4 ISA & 1 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
- MS Works Multimedia Edition 3.0
- The Real 3 Year Warranty

Monitor Upgrade

Ask your sales representative how you can upgrade your monitor to a 15" or 17" Elite monitor.

14" to 15" $89
14" to 17" $419
15" to 17" $319

*All Systems with a CD-ROM include TestDrive CD Sof

ELITE NOTEBOOKS

Elite SoundBook

- Intel® 486, DX2 or DX4 Processor
- 4 Mb RAM (expands to 20 Mb)
- 9.5" Mono, 10.5" Dual Scan, or 9.5" Active Matrix VGA Display
- Local Bus Video with 1 Mb Video Display
- Business Audio Features Including: Built-in Microphone & Speaker External Jacks for Line In & Line Out
- 3.5" Built-in Disk Drive
- User Replaceable Hard Drive
- Two Type II/One Type III PCMCIA Slot
- Built-in Trackball
- NiMH Battery & AC Adapter
- Advanced Power Management with SMI
- One Parallel & One Serial Port
- External VGA & Keyboard Port
- MS-DOS 6.2 & WFW* 3.11
- Lotus Organizer*
- Microsoft Works For Windows 3.0
- Weight: Mono – 6.2 lbs. Color – 6.7 lbs.
- Carrying Case
- One Year Manufacturer's Warranty

intel inside

*** Ask your MidWest Micro sales representative about additional hard drive, screen and processor options.**

Dual Scan Color SoundBook

486SX-33 with 260 Mb HDD
#007328 **$1999**

486DX-33 with 260 Mb HDD
#007329 **$2199**

DX2-50 with 340 Mb HDD
#007330 **$2299**

DX2-66 with 520 Mb HDD
#007331 **$2499**

DX4-75 with 340 Mb HDD & 8 Mb of RAM
#007332 **$2799**

DX4-100 with 520 Mb HDD & 8 Mb of RAM
#007333 **$2999**

DX4-100 with 520 Mb HDD, 12 Mb of RAM, PCMCIA 14.4 Fax Modem & PCMCIA Ethernet Adapter
#008003 **$3499**

DX4-100 with 520 Mb HDD, 20 Mb of RAM, PCMCIA 14.4 Fax Modem & PCMCIA Ethernet Adapter
#008004 **$3999**

Monochrome SoundBook

486SX-33 with 260 Mb HDD
#007334 **$1499**

486DX-33 with 260 Mb HDD
#007335 **$1699**

DX2-50 with 340 Mb HDD
#007336 **$1799**

DX2-66 with 340 Mb HDD & 8 Mb of RAM
#008001 **$1999**

DX4-75 with 520 Mb HDD, 8 Mb of RAM & PCMCIA 14.4 Fax Modem
#008002 **$2499**

Active Matrix SoundBook

DX2-66 with 340 Mb HDD & 8 Mb of RAM
#007337 **$3499**

DX4-75 with 520 Mb HDD & 8 Mb of RAM
#007338 **$3799**

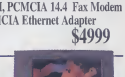
DX4-100 with 520 Mb HDD, 8 Mb of RAM & PCMCIA 9624 S/R Fax Modem
#007339 **$3999**

DX4-100 with 520 Mb HDD & 20 Mb of RAM
#008005 **$4499**

DX4-100 with 520 Mb HDD, 20 Mb of RAM, PCMCIA 14.4 Fax Modem & PCMCIA Ethernet Adapter
#008006 **$4999**

Options

4 Mb RAM Card	#005976	$219
8 Mb RAM Card	#005977	$469
16 Mb RAM Card	#005978	CALL
Car Adapter	#005979	$ 59
Mobile Max PCMCIA 105 Mb HDD	#004801	$342
PCMCIA 9624 Fax Modem	#001722	$135
PCMCIA 14.4 Fax Modem	#001812	$179
PCMCIA Ethernet Adapter	#001832	$159



Elite 486SX SubNote

- Intel 486SX SL-Enhanced Processor
- 4 Mb RAM (expands to 12 Mb)
- 9.5" Mono or Dual-Scan VGA Display
- Turbo Bus Accelerated Video
- 3.5" External Disk Drive
- User Replaceable Hard Drive
- One Type II PCMCIA Slot
- Built-in Trackball
- NiMH Battery & AC Adapter
- Advanced Power Management with SMM
- One Parallel & One Serial Port
- External VGA & Keyboard Port
- MS-DOS 6.2
- Weight: 3.9 lbs.
- Carrying Case
- One Year Manufacturer's Warranty

Monochrome SubNote

486SX-25 with 260 Mb HDD
#007342 **$1299**

486SX-25 with 340 Mb HDD & PCMCIA 9624 S/R Fax Modem
#007307 **$1499**

Dual Scan Color SubNote

486SX-33 with 260 Mb HDD, WFW 3.11 & Lotus Organizer
#007340 **$1899**

486SX-33 with 340 Mb HDD, WFW 3.11 & Lotus Organizer
#007341 **$1999**

486SX-33 with 520 Mb HDD, 8 Mb of RAM, WFW 3.11, Lotus Organizer & PCMCIA 14.4 S/R Fax Modem
#008007 **$2499**

Options

4 Mb RAM Card	#005970	$219
8 Mb RAM Card	#005971	$469
Car Adapter	#005972	$ 65
Mobile Max PCMCIA 105 Mb HDD	#004801	$342
PCMCIA 9624 Fax Modem	#001722	$135
PCMCIA 14.4 Fax Modem	#001812	$179
PCMCIA Ethernet Adapter	#001832	$159

Seagate

Disclaimer: The Intel Inside Logo, Intel, Pentium and OverDrive are registered trademarks of the Intel Corporation. Seagate and the Seagate Logo are registered trademarks of Seagate Technology. The Energy Star emblem does not represent EPA endorsement of any product or service. All products are trademarks of their respective manufacturers. All registered and unregistered trademarks are the sole property of their respective companies.

Call or write for your Free MidWest Micro catalog.

Policy: No service charge for credit card orders. Prices are subject to change. Repair or replacement of defective products is at MidWest Micro's discretion. We are not responsible for errors in typography and photography. Original shipping and handling fees, as well as return shipping charges, are non-refundable. There are no returns for credit after 30 days. Call or write MidWest Micro for more information on warranties and policies

MidWest Micro
6910 U.S. Route 36 East, Fletcher, Ohio 45326
1-800-682-7248
Fax:1-800-562-6622
Monday-Friday 9 a.m. to 7 p.m. Saturday 10 a.m. to 4 p.m.

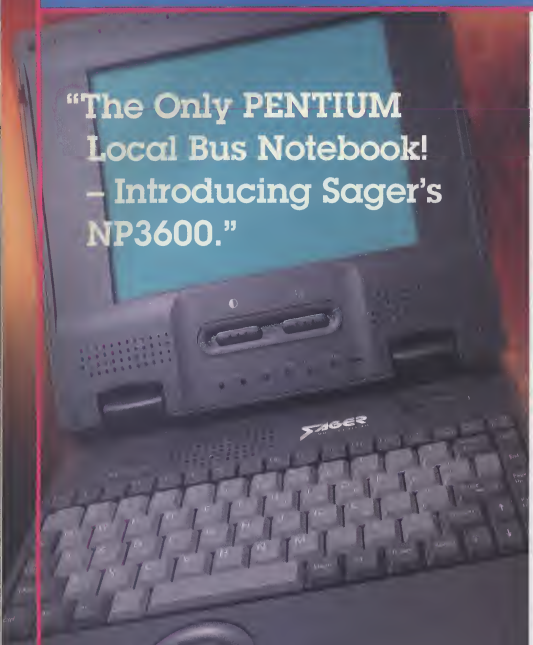
For your protection we check thoroughly for stolen credit cards

Technical Support:
1-800-262-6622
Customer Service:
1-800-728-8584
Dealers Call:
1-800-682-4711
AD#M09

Circle 276 on reader service card.

P O W E R F U L P

"The Only PENTIUM Local Bus Notebook! – Introducing Sager's NP3600."



NOW MAXIMUM POWER IS AVAILABLE IN PORTABLES WITH SAGER'S PENTIUM & 486 DX-4 NOTEBOOKS.

With more power than most desktops, these Sager notebooks were developed exclusively for performance-driven notebook users. Sager designed and built these systems with one goal – to give you the performance capabilities and features of the most powerful desktop, in a compact, lightweight notebook. These portable powerpacks feature Pentium performance, [illegible] upgradeability, both Local Bus video and Local Bus [illegible], audio and more. The result is powerful performance [illegible] than any other notebook.

PENTIUM NP3600 CONFIGURATIONS

- Intel Pentium™ 60/66MHz CPU
- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 32-bit Local Bus IDE
- Built-In Audio Chip, Microphone, & Speaker
- 8MB RAM Expandable to 40MB
- Removable 250MB Hard Drive (340, 520MB Optional)
- 3.5" 1.44MB Floppy Drive
- 10.3" Dual Scan or 9.5" Active Matrix VGA Display, CRT, 1024x768 256 Colors
- Simultaneous CRT & LCD Operation
- Extra Large Built-In 25mm Trackball
- 1 Type II & 1 Type III PCMCIA Slots
- 46 Watt NiMH Battery
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Ports for Ext. Keyboard, Ext VGA Monitor & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 8.1lbs (with Battery)
- 11.14"W x 10.31"D x 2.56"H
- Sager's Umbrella Protection Policy

NP3600 FEATURES

- Intel Pentium™ 64-bit performance
- Super Fast 32-bit VESA Local Bus Video with Windows Accelerator & 1MB Video RAM
- 32-bit Local Bus IDE, improved data transfer rate of up to 45%
- 1 PCMCIA Type III & 1 PCMCIA Type II Slots
- Built-In Audio Chip, Microphone, & Speaker (Now you can record, compress, store and playback voice, sound, and music to disk Soundblaster and Microsoft Windows Sound System compatible)
- VESA Local Bus Power when used with Optional VL-Bus Docking Station
- 46 Watt Extra Large NiMH Battery
- Extra Large Built-In 25mm Trackball
- Large Palm Rest Area for Easy Typing
- Flash ROM for BIOS Upgrade through software
- 2-Hour Quick Charge

NP3600 / NP7500 OPTIONS

VL-Bus Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards (Fax/Modem, Ethernet LAN Adapter, SCSI Adapter & more)

486 NP7500 CONFIGURATIONS & FEATURES

- Intel SL enhanced CPU upgradeable to 486DX4 (486SX>DX>DX2>DX4)
- 1MB Video RAM
- Super Fast 32-bit VESA Local Bus Video with Windows Accelerator
- Super Fast 32-bit Local Bus IDE with improved data transfer rate of up to 45%
- Built-in Audio Chip, Microphone, & Speaker (Now you can record, compress, store and playback voice, sound, and music to disk
- Extra Large Capacity NiMH Battery – No Memory Effect and 40%-50% Longer Running/Operating Timespan
- Large 19mm Trackball Centered on Large Palm Rest Area for Easy Typing
- 2 PCMCIA Type I & II or 1 Type III IC Card Slot
- Flash ROM for BIOS Upgrade through software
- 4MB RAM expandable to 36MB
- Removeable 250MB Hard Drive (340, 520MB Optional) offers flexibility, upgradeability and security
- 3.5" 1.44MB Floppy Drive
- 9.5" 640x480, VGA Display 256 Colors or 64 Gray Shades CRT 1024x768 256 Colors
- Simultaneous CRT & LCD Operation
- 180° LCD Display Angle Rotation
- Built-in System Management Mode (SMM)
- Ports for 1S, 1P, Ext. keyboard, Ext VGA monitor, & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 6.6lbs. (with Battery)
- 11.14"W x 9.48"D x 1.95"H
- 2-Hour Quick Charge
- VESA Local Bus Power when used with Optional VL-Bus Docking Station
- Sager's Umbrella Protection Policy

SAGER SYSTEMS	MONO	COLOR DUAL SCAN	COLOR ACTIVE MATRIX
NP3600/PENTIUM-60		$3195	$4195
NP3600/PENTIUM-66		$3345	$4345
NP7500/486SX-33	$1545	$2045	$2945
NP7500/486DX-33	$1725	$2225	$3125
NP7500/486DX2-66	$1775	$2275	$3175
NP7500/486DX4-100	$2095	$2595	$3495
NP700/486SX-25	$1295	$1795	$2645
NP700/486DX-33	$1475	$1975	$2825
NP700/486DX2-66	$1495	$1995	$2845

486 NP700 CONFIGURATIONS

- 1MB Video Ram
- 4MB RAM expandable to 16MB
- Removable 120MB Hard Drive (250, 340, 520MB Optional)
- 3.5" 1.44MB Floppy Drive
- 9.5" 640x480, VGA Display 256 Colors or 64 Gray Shades
- Large Built-In 16mm Trackball (Can be replaced with another module)
- PCMCIA Type I & II Slot
- Ports for 1S, 1P, Ext keyboard/keypad, VGA monitor & AT/Bus for expansion box
- 85-Key Keyboard
- Nickel Metal-Hydride battery
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 5.5lbs. with Battery
- 11.4"W x 8.6"D x 1.65"H
- Sager's Umbrella Protection Policy

NP700 FEATURES

- Module Pack Area (Optional) Fax/Modem, PS/2 Mouse+COM 2, Audio
- PCMCIA Slot
- Intel 486 Upgradeable CPU (486SX >486DX >486DX2)
- 180° LCD Display Angle Rotation
- 2-Hour Quick Charge
- NiMH Battery: No memory effect, Longer Battery Life
- External Battery Pack: (Optional) Doubles Running Hours Screws Into Bottom Back of Notebook Raising & Angling Keyboard for Easy Typing

NP700 OPTIONS

FAX/Modem Module
PS/2 Mouse + COM 2 Port Module
Audio Module
Internal/External Battery Pack
Numeric Keypad
Car Adapter
Expansion Box
PCMCIA Cards (Fax/Modem, Ethernet LAN Adapter, SCSI Adapter & more)

SAGER'S UMBRELLA PROTECTION POLICY

- **Two-Way 30-Day Money-Back Guarantee.** If the equipment does not work as promised, we'll pay your purchase price PLUS all shipping charges both ways!
- **48-hour Repair Promise** For the first 30 days, we'll repair or replace your computer within 48 hours (we will pay and pay) all shipping charges both ways!
- **72-hour Repair Promise.** For the rest of the 1 year warranty period, if it takes more than 72 hours to repair, you complete peace of mind, we will pay all shipping charges both ways
- **1-Year Parts and Labor Limited Warranty.**
- **Lifetime Toll-Free Technical Support.**

Umbrella Policy Applies to End Users in the United States of America and in Canada Only

DEALER, VAR, GOVERNMENT, & CORPORATE SPECIAL PROGRAMS

NOTEBOOK SYSTEMS STANDARD FEATURES

- 2 32-bit VESA Local Bus Slots
- 2 16-bit ISA Slots
- 1 3.5" HDD bay
- 1 CD-ROM or 5.25" HDD bay
- Ports for 2S, 1P, Ext. Keyboard, VGA Monitor
- Internal Speakers
- Integrated 110/220v, 120w power supply
- 14.5"W x 14.4"D x 4.9"H
- Large, Solid Platform for External Monitor

CALL NOW!

SAGER
The Portable People

[illegible]

[illegible]
Cashiers / Checks
Lifetime [illegible]
One Year [illegible]
30-Day Money [illegible]
American [illegible]
Discover Card [illegible]
NO SURCHARGE
Cashiers Checks [illegible]
Hours Mon. Fri. [illegible]
Sat. 9AM-3PM (PST)

© 1994 by Modem Computer, Inc. All [illegible]
All company [illegible] or product names are trademarks and/or [illegible] of their respective [illegible]. All [illegible] screens are simulated [illegible] specifications are subject [illegible] change without [illegible]

OUR WORLD IS GRAND AND FULL OF COLOR.

PICTURE IT ON AN AMDEK MONITOR!

Whether your business is "at the office" or with your family at home, Amdek can help you and your family display the best of our world's grandeur and dazzling color. Amdek introduced the industry's first PC video monitor in 1978 and has been successfully providing display solutions with crisp, rich images at very competitive prices for over fifteen years. The AM/815E and AM/817E color Amdek monitors meet the stringent Swedish MPR-II low radiation emission guidelines and the VESA DPMS Energy Star power savings standard to help protect you and conserve our world's energy. Amdek "Direct" offers great prices, a 30-day "no questions asked" money back guarantee, toll-free technical support, and a standard one year warranty with available extended warranty programs. Amdek also has special programs for resellers, state and local government, and educational and corporate accounts. You will find that Amdek "Direct" can deliver the best combination of great prices, proven support, and feature rich monitors right to your door! Give us a call today.

Amdek Family of Display Products

	AM/432E	AM/732E	AM/732NI	AM/815E	AM/817E
Screen Size	14"FS VGA Mono	14" SVGA Color	14" SVGA Color	15"FS SVGA Color	17"FSHi-Res Color
Max Resolution	640x480	1024x768	1024x768NI	1280x1024NI	1600x1200NI
Max Refresh Rate	70 Hz	70 Hz	90 Hz	90 Hz	105 Hz
Horizontal Scan Freq.	31.5KHz	31.5, 35.2, 35.5KHz	30KHz-57KHz	30KHz-64KHz	24KHz-82KHz
Dot Pitch	N/A	.28mm	.28mm	.28mm	.26mm
110-240 VAC (Auto-sensing)	Yes	Yes	Yes	Yes	Yes
MPR II Compliant	No	No	No	Yes	Yes
Energy Star Compliant	Yes	No	No	Yes	Yes
PIN Cushion Control	No	No	No	Yes	Yes
* Amdek "Direct" Price	$102	$249	$269	$379	$799

To Order Call Toll Free:
1-800-72-AMDEK
Call For Volume Discounts
FAX #:1-800-74-AMDEK

State and local government, educational and corporate accounts can contact their Amdek sales representative at 1-800-79-AMDEK

AMDEK
VALUE THROUGH THE YEARS

*Amdek "Direct" accepts Visa, Mastercard, or cashier's check. Trade accounts are available with credit limits and terms. Shipping and applicable sales tax not included in the price. All prices, offers and specifications are subject to change without notice. Any return being shipped to an Amdek location will require an RMA (Return Merchandise Authorization) number. Original packaging and proof of purchase required to return any merchandise. Amdek is a registered trademark of Wyse Technology Inc. Monitor image provided courtesy of NASA. The EPA Energy Star™ emblem does not represent EPA endorsements of any product or service. All other trademarks are the property of their respective owners and are used for identification purposes only. ©1994 Wyse Technology Inc.

Circle 193 on reader service card.

We Got Tools Out the Wahzoo!

Finally! A CAD System that is all it is cracked up to be. There is nothing extra to buy! DesignCAD 2D for Windows comes complete with all the tools you will need to produce professional designs (from doghouses to Space Shuttles.)

You'll be drawing within minutes thanks to DesignCAD's On-line Instruction and logical interface!

Save time by recording your actions to a Macro so you never have to do the same thing twice. Also, you can put your most-used tools in a "Hot Toolbox" to readily access your most-used commands.

DesignCAD 2D for Windows offers more editing options than other CAD packages. For example, with our "Quick-Change Edit Box" just enter your new specifications and the changes are made for you.

Plus, DesignCAD 2D for Windows offers more than 50 dimensioning options. The dimensioning will even change automatically to reflect your modifications.

Best of all, you can own DesignCAD 2D for Windows for thousands less than comparable Computer Aided Design systems. Call, write or fax to order your copy **TODAY!**

DesignCAD 2D for Windows Only $349 or less!

(All Tools Included)

DesignCAD 2D is Also Available in DOS!

Call for a FREE brochure and Demo Disk!

PC MAGAZINE EDITORS' CHOICE December 17, 1991

Phone (918) 825-7555
Fax (918) 825-6359

American Small Business Computers • One American Way • Pryor • OK • 74361

Circle 166 on reader service card.

PCM 9/94

Since 1982

ComputAbility

Consumer Electronics

FREE CardShopPlus... An investment for the whole family!*

*with the purchase of any printer in this ad, offer good through 8/31/94

THE SOFTWARE TOOLMAKERS

A complete card shop in your home... CardShopPlus for Windows! A $39.95 Value!

EPSON

Stylus Color - NEW!	$539
ActionLaser 1600 - NEW!	$925
Action 3260 / with Color Kit	$179 / $205
ActionLaser 1500	$649
Stylus 400 - NEW!	$237
Stylus 800+ - NEW!	$262
LX 300 - NEW! / with Color Kit	$165 / $205

digital

NEW!

DEC writer 55 Dot Matrix	$189
DECwriter 500i Ink Jet / with Color Kit	$369 / CALL!
DEClaser 1800 Laser	$735
DEClaser 5100 Laser	$1,439

Canon

BJ-200e Bubble Jet	$259*
BJ-230 Bubble Jet	$355*
BJC-600 Color Bubble Jet	$539*
LBP 430 Laser Beam Printer	$555*

*Prices reflect $30 rebate, good through 8/31/94

HEWLETT* PACKARD

HP DeskJet 520 Printer	$289
HP DeskJet 560C Printer	$559
HP DeskJet 310 Printer printer alone / with cutsheet feeder	$299 / $359

TEXAS INSTRUMENTS

microMarc Ink Jet	$235
microMarc Color Ink Jet	$365
microWriter Basic, 5PPM Laser	$509
microWriter PS23 5PPM with PS	$679
microLaser Pro 600 PS23	$1,159*

*Price reflects $150 rebate, good through 8/31/94

OKIDATA

OL410e LED Page Printer	$639
OL400e	$489

800-554-9952

Call for ordering information

Please reference this code when ordering by phone or fax. **K=304**

Hrs (CST): M-F 8am - 8pm, Sat. 9am - 5pm • Tech Info 1pm - 5pm (414) 357-8181 • Fax (414) 357-7614

MEMORY DATA STORAGE

LIFETIME* WARRANTY 100% GUARANTEED

IBM

RS/6000 POWERSERVER 750, 830 RS//6000 POWERSTATION/POWERSERVER 3E0, 4E0E, 320R, 5E0, 0E0H, 530 530E, 530 h, 050 000E 0000, 000, 000F
16MB 4010 1000
32MB 4033 1642
64MB 4030 8177

RS/6000 POWERSERVER E00 RS/6000 POWERSTATION/POWER SERVER 000, 360R, 350, 360R, 050, 970 580
16MB 4010 1000
32MB 4033 1642
64MB 4030 8177
128MB 4082 7100

RTS/6000 POWERSTATION/POWERSERVER 220 SERIES
4MB 8490128 180
8MB 7303132 430

AMORA KUROLA 0000X, SPRIKTA 300 AMRRA ERTEKPRISE 300 SLIM
2MB 90
8MB 330

AMORA RUROLA 4000X, HURDL 4000X, SPRIRTA 4000X, SPRIRTA 4000X2, SPRIRTA 4008X, AMORA ESTERPRISE 450 FULLSIZE DX03, 486 FULLSIZE 0X2 50, 486, FULLSIZE DX2 60, 486, FULLSIZE SX25 486 FULLSIZE DX33, 486 SLIM
4MB 180
16MB 700

PC AT, XT/286
2 16MB AT A8OARDI 180
4 16MB AT A8OARDI 299
8 16MB AT A8OARDI 440

PS/1 E50 MODEL 2011
512KB 1057035 40
2MB 92F0830 120

PS/1 300 MODEL 2121
2MB 92F0035 120
4MB 92F0034 180

PS/1 ADVISOR MODEL 2133-M40, MODEL 2133 M60
PS/1 CONSULTANT MODEL E133-040, MODEL 2133-040, MODEL 2156-062, MODEL 2155-072, MODEL 2168-00E, MODEL 2168-087, MODEL E168 68T
PS/1 ESSENTIAL MODEL 2133-W4E, MODEL 2133-W40, MODEL 2155-W48, MODEL 2156 W67, MODEL 2155-W77, MODEL 2168 W02, MODEL 2168-W0E
PS/1 EXPERT MODEL 2168-048, MODEL 2133-047, MODEL 2130-080, MODEL 2155 070, MODEL 2155-078, MODEL 2150 060, MODEL 2168 065 MODEL 2168 300
PS/1 INVESTOR MODEL 2155-P74, MODEL 2155-P84, MODEL 2168-P00
PS/1 WILLOW SERIES 2133-401, 2133 401, 2155-471, 2155-483, 2155 402, 2155-403, 2155-473, 2158 403
2MB 179
4MB 220
8MB 400
16MB 600

PS/1 CONSULTANT MODEL 2103-011, MODEL 2133-016, MODEL 2168 014
PS/1 ESSENTIAL MODEL 2133-W11, MODEL 2133 W13 MODEL 2155-W14
PS/1 EXPERT MODEL 2103 011, MODEL E103-013 MODEL 2105-014
1MB 6450003 60
2MB 6450008 90
4MB 8450128 180
8MB 73G3132 430

PS/1 CONSULTANT MODEL 2134-043, MODEL 2168 044
PS/1 ESSENTIAL MODEL 2168-W48, MODEL 2168 W44
PS/1 EXPERT MODEL 2138-603, MODEL 2153 044
PS/VALUEPOINT 6384 SYSTEM F50, 6384 SYSTEM F20, 6384 SYSTEM F60, 6384 SYSTEM M00, 6384 SYSTEM M20, 6384 SYSTEM M40, 6384 SYSTEM M60, 6384 SYSTEM W40
PS/VALUEPOINT 6384 SYSTEM F23, F60, M60, M63 W53
4MB 06F200 270
16MB 06F8261 840

PS/1 CONSULTANT MODEL E160 070
PS/1 ESSENTIAL MODEL E168 W70
PS/1 EXPERT MODEL 2168-070
16MB 06F0261 900

PS/E MODEL 06 SLC
PS/E MODEL 50 SLC LS
PS/2 MODEL 06 SX, LS
PS/2 MODEL 07 SLC
PS/2 MODEL 07 SX
PS/E MODEL 50 XP 486
PS/2 MODEL 90 XP 486
2MB 6450002 180
4MB 6450128 180
8MB 73G3132 435

PS/E MODEL 53, 33LS
4MB 8450128 180
8MB 73G3132 300

PS/2 MODEL 25/E50 006, 030 060 036 PS/2 MODEL 35/250 E01 E21, E31, E41
2-16MB 4T A8O4RD! 180
4 16MB AT A8O4RD! 300
8-16MB 4T A8O4RD! 640
2MB 30F5360 120

PS/2 MODEL 35 LS, SX
PS/2 MODEL 40SX
1MB 6450603 90
2MB 6450604 90
4MB 43F2833 180
8MB 6450128 380

PS/2 MODEL 50 321
PS/2 MODEL 50Z 061, 061
PS/2 MODEL 80 041 0T1
1 16MB 6450605 210
2 16MB 6450609 240
4 16MB 6490900 330
1MB 6450603 90
2MB 8460604 90
4MB 34F2833 180

PS/2 MODEL 55LS
PS/2 MODEL 55SX 031, 061, 061, 081
PS/2 MODEL 60SX
2 16MB 6450608 280
4 16MB 6450608 330
2MB 6450604 90
4MB 34F2833 180

PS/2 MODEL 70 061, 081, 121, 161, E01
PS/2 MODEL 80 0T1
4 64MB 370
8-64MB 600
2 16MB 34F3077 240
4 16MB 34F3011 400
1MB 6450003 90
2MB 6450604 90
4MB 34G1622 180
8MB 6450128 380
16MB 80G1822 600

PS/MODEL 70 A10, A21, A81, A01, 021, 001
4-64MB 370
8 64MB 600
2-16MB 34F3077 200
4-16MB 34F3011 300
1MB 6450003 90
2MB 6450804 90
4MB 34G1622 180
8MB 6450128 400
16MB 80G1822 600

PS/E MODEL 80 041
4 64MB 370
8 64MB 600
2-16MB 34F3077 280
4 16MB 34F3011 960
1MB 6450903 50
2MB 6450604 90
4MB 34G1622 130
8MB 8450128 305
16MB 60G1822 600

PS/2 MODEL 90 081 111, 121, 161, 311, 331
4 64MB 870
8-64MB 500
2 16MB 34F3077 840
4 16MB 34F3011 330
1MB 6450603 90
2MB 6480604 90
4MB 34G1822 180
8MB 6450128 300
16MB 60G1822 960

PS/2 MODEL 90 A10, A21, A31
4 64MB 370
8-64MB 600
2 16MB 34F3077 240
4 16MB 34F3011 300
1MB 6450803 90
2MB 6450804 90
4MB 34G1622 180
8MB 6450180 300
16MB 60G1822 960

PS/2 MODEL 90 XP 400 3300 OMF 0000 OMG 0500 DMT
4MB 6451150 200
8MB 6451100 400

PS/2 MODEL R81 SX
2MB 07G1826 130
4MB 07G1827 300
8MB 07G1828 960

PS/E SERVER 90 0000 RPT (PERTIUM), 0000 1RD, 9000 1RT
PS/2 SERVER 95 ARRAY 9550 3RD, 9550 3RT, 0500 3PG (PENTIUM), 9595 3PT (PENTIUM), 9500 3OT (PENTIUM)
4MB 6451150 200
8MB 6451158 400
16MB 32G3720 820

PS/VALUEPOINT 6380 SYSTEM C50, 3384 SYSTEM C20, 6380 SYSTEM C40
2MB 6450808 120
4MB 34F2833 180
8MB 6450128 300

PS/VALUEPOINT 6381 SI SERIES F50, F30, F60, M00, M30, M60 W00, W30, W60
4MB 73G3131 240
16MB 60G1622 840

PS/VALUEPOINT 6382 SYSTEM F60
PS/VALUEPOINT 6380 SYSTEM F02
PS/VALUEPOINT 330T
2MB 6450902 120
4MB 6450128 180
8MB 73G3132 430
16MB 60G1822 960

RS/6000 POWERSTATION/POWERSERVER 200 (POWER PC)
4MB 6450128 180
8MB 73G3132 435
16MB 60G1022 960
32MB 1870

VALUEPOINT P60O 6384 180
4MB 73G3131 240
8MB 73G3132 435
16MB 60G1822 600
32MB 1870

VALUEPOINT P60O 3380 160
4MB 73G3131 200
8MB 73G3132 435
16MB 60G1822 840

XSTATION 130
1MB 6450803 90
2MB 6450804 90

XSTATION 130
1MB 4201 180
1MB 6450903 90
2MB 6450804 50
4MB 34F2833 180

AMOKA TREKA 3300L
2MB 100

PS/E MODEL CL07 SX TRIRSPAD 700, 750C, T20, TEOC
4MB 07G1420 200
4MB 07G1420 200
8MB 07G1421 400
8MB 07G1421 400

PS/E MODEL L40SX PS/NOTE 10E
2MB 79F0900 110
4MB 79F1000 200
8MB 79F1001 410

PS/E MODEL R330X
2MB 79F0800 110
4MB 79F1000 205

PS/2 MOREL R81 SLC, SX
2MB 07G1827 180
4MB 07G1827 200
8MB 87G1828 60E

PS/NOTE 2141 ROE
2MB 140
4MB 240
8MB 470

PS/ROTE R40 SL
2MB 92F8857 110

PS/ROTE 2610 C40, E30, M60, TRIRSPAD 300 350C
4MB 79F1000 200
8MB 07G1828 960
16MB 60G0378 960

PORTABLE PS/2 MODEL P70 031, 061, 1E1
2-16MB 34F3077 200
4-16MB 34F3011 320
1MB 6450903 90
2MB 6460604 90
4MB 34F2833 180

PORTABLE PS/2 MODEL P70
2MB 6450902 120
4MB 6450128 180

TRIRSPAD 360
2MB 33G6200 120
8MB 33G8200 370

TKIRKPAD 500
4MB 8169098 299
8MB 8169089 480

TRIRSPAD T60 T50C T50C0, T60P
4MB 07G1420 200
8MB 07G1421 400
16MB 06G5100 960

THIKKPAD T10T
2MB 53G0050 170
4MB 53G0050 220
8MB 53G0960 435

COMPAQ

CORTURA 3/20,3/25,3/25C
2MB 136497001 110
4MB 136469001 200
8MB 136489001 290

CORTURA 4/25,4/25C,4/25CX
4MB 148520001 200
8MB 148521001 605
16MB 148531001 960

LTE 0000 PROCESSOR
512K 117877001 90

LTE 250
1MB 117081001 70
2MB 117081002 120
4MB 117081003 200

LTE 3000/25
1MB 121125001 100
2MB 140
4MB 121125002 290

LTE LITE 20
2MB 128769001 140
4MB 128769003 200
8MB 128769003 400
16MB 128769004 630

LTE LITE 20,20C E0E
2MB 128769001 140
4MB 128769003 250
8MB 128769003 480
16MB 128769004 830

LTE LITE 4/20,E0C,33C
4MB 142337002 220
8MB 142337003 420
16MB 142337004 900

PAGEMARO 20
2MB 128359001 150
4MB 126360001 290
8MB 128361001 415
16MB 126362001 815

PAGEMARO 10
4MB 126360001 205
8MB 126361001 410
16MB 126362001 810

PROLIREA 3/200,3/25Z0
2MB 141730001 160
8MB 141742001 950

PRESARIO 0E3
PROLIREA 4/200,4/33,4/00, 4/00 C00
PROLINEA 4/300
1MB 141882001 90
2MB 141883001 110
4MB 141884001 180
8MB 141885001 375
16MB 148320001 880

PROSIGKIA PC SERVER
1MB 118688001 90
2MB 118689001 110
4MB 118690001 180
8MB 128877001 375
16MB 148320001 880
32MB 148147001 1600

SLT/286
1MB 110238001 90
4MB 110237001 200

SLT 3800/20
1MB 118303001 90
2MB 118304001 140
4MB 118305001 230

PORTABLE III
512K 107331001 90
2MB 107332001 180
2 8MB 107811001 200
16BIT 107908001 110

PORTABLE 386
1MB 1007851001 180
4MB 107653001 320
4MB 107654001 320
32BIT 107707001 115

DESKPRO 5/60M 5/60M
8MB 149811001 810
16MB 149649001 810
32MB 149812001 1630
64MB 149813001 3000
128MB 149814001 7004

PORTABLE 486C
2MB 118689001 110
4MB 118690001 180
8MB 128877001 370

DESKPRO 200
2MB 180
0 16MB 120

DESKPRO 200/8,200/12
512K 113012001 90
0/16MB 125

DESKPRO 286N
1MB 118689001 90
4MB 118690001 180
0 16MB 120

DESKPRO 286E
512K 113012001 90
1MB 113131001 85
4MB 113132001 210
0 16MB 120

DESKPRO 386
1MB 108071001 120
1MB 108067001 210
2MB 108068001 810
4MB 108070001 435
8MB 10807 72 710
1MB 108071001 120
4MB 108072001 200
64MB 149813001 3835
128MB 149814001 7204

DESKPRO 386K,3800/20R
1MB 118568001 90
2MB 118689001 110
4MB 118690001 180
0 12MB 118700001 120

DESKPRO 3800
1MB 113633001 70
4MB 113634001 220
1MB 113545001 70
4MB 112534001 210

DESKPRO 386/16
1MB 108071001 170
1MB 108069001 210
2MB 108069001 310
108071001
4MB 108072001 200
4MB 108070001 435
8MB 108070001 710

DESKPRO 3000/33
1MB 118688001 90
2MB 118689001 110
4MB 118660001 180

DESKPRO 386/20
1MB 113131001 90
4MB 113132001 210

DESKPRO 386/20
1MB 113131001 90
4MB 113132001 210

DESKPRO 386/20E
1MB 113844001 170
4MA 113845001 810
1MB 113131001 80
4MB 113132001 210
1-8MB 113844001 170
4 12MB 113645001 810

DESKPRO 386/25E
1MB 113844001 170
4MB 113845001 210
1MB 113131001 90
4MB 113132001 210

DESKPRO 3/25I,3/33I
512K 141236001 90

DESKPRO 386/33
2MB 115144001 180

DESKPRO 386/33L
2MB 115148001 180
8MB 118561001 405
32MB 118509001 1070
6SOCK 118569001 700

DESKPRO 486/33L
2MB 115144001 180
8MB 118561001 400
32MB 118588001 1070
8SOCK 118569001 900

DESKPRO 486/25
2MB 115144001 180
8MB 118581001 480
32MB 118569001 1070

DESKPRO 486/50L
2MA 115148001 180
8MA 118581001 480
32MB 118568001 1076

DESKPRO 386/25M
1MB 118688001 90
2MB 118689001 110
4MB 118690001 180
8MB 128877001 370
6SOCK 129150001 200

DESKPRO 486/33M
1MB 118689001 90
2MB 118689001 110
4MB 118690001 180
8MB 128677001 370
8SOCK 128160001 200

DESKPRO 6000/16M
1MB 118688001 50
2MB 118689001 110
4MB 118690001 180
8MB 128877001 375
8SOCK 128160001 200

DESKPRO 4000/20M
1MB 118689001 90
2MB 118889001 110
4MB 118690001 180
8MB 128877001 370
8SOCK 128150001 200

DESKPRO 286R
1MB 118688001 90
2MB 118889001 110
4MB 118690001 160
3SOCK 118700001 120

DESKPRO 386R
1MB 118689001 90
2MB 118689001 110
4MB 118690001 180
3SOCK 118700001 120

DESKPRO 3800/20E
1MB 118689001 90
2MB 118689001 110
4MB 118690001 180
3SOCK 118700001 120

SYSTEMPRO
2MB 115144001 180
8MB 118561001 600
32MB 118568001 1070
6SOCK 118569001 200

SYSTEMPRO/LT 600-25
1MB 118688001 50
2MB 118689001 110
4MB 118690001 180
8MB 128877001 370
8SOCK 128150001 200

SYSTEMPRO/LT 486-33
1MB 118688001 90
2MB 118689001 110
4MB 118690001 180
8MB 128877001 370
8SOCK 128180001 200

SYSTEMPRO/LT 4000-25
1MB 118689001 90
2MB 118889001 110
4MB 118690001 186
8MB 128877001 375
8SOCK 128180001 200

SYSTEMPRO/XL 4000/60
16MB 136810001 820
32MB 136817001 1820
64MB 2985
128MB 13810001 6300

DESKPRO I SERIES 3/25I, 3/33I,4/E0,4/33I,4/66I
512K 141236001 CALL
1MB 118688001 90
2MB 118689001 110
4MB 118690001 180
8MB 128877001 370

DESKPRO M SERIES 386/20M, 386/33M 4A0/16M,4000, 486/33M,4000X2/50M, 4000X2/66M
1MB 118689001 90
2MB 18689001 110
4MB 118690001 180
8MB 128877001 375
2 64MB 118889001 200

PRESARIO 425
1MB 141682001 90
2MB 141683001 110
4MB 141684001 180
8MB 141885001 370

PROLIREA MT 4/330 MT 4/50 MT 4/66
2MB 141683001 110
4MB 141684001 180
8MB 141685001 370
16MB 148320001 885
32MB 148147001 1000

CONCERTO 4/25,4/33
4MB 144790001 840
8MB 144790002 475

PROLIANT 1000 5/60 (PEKTIUM) PROSIGRA PC SERVER 5/60 (PERTIUM)
16MB 149840001 810
32MB 148812001 1830
64MB 148813001 3000
128MB 149914001 7284

PROLIANT 2000 486/50 5/60 (PERTIUM) PROLIANT 4000 486/50, 5/60 (PERTIUM)
16MB 149640001 810
32MB 149612001 1630
64MB 149613001 3630
128MB 149614001 7284
0 256MB 139830001 CALL

DESKPRO XE 4330, 450, 480 PRESARIO 450C SERIES 500 PRESARIO 860F SERIES 833 CDS, 860, 880
PROLINEA NET 1/250
2MB 141683001 110
4MB 141684001 180
8MB 141865001 370

DESKPRO 5/60M (PERTIUM), 5/60M (PERTIUM), DESKPRO XE 560 (PERTIUM)
8MB 149811001 810
16MB 149648001 815
32MB 149812001 1600
64MB 148913001 3836
128MB 149914001 7284

PROLIANT 1000 486DXE/66
8MB 141585001 370
16MB 149320001 885
32MB 148147001 1000

TOSHIBA

DYNAPAD T100X
4MB PCPA2018U 223
8MB PCPA2017U 320

T1000SE
1MB PCPA8311U 70
2MB PCP48312U 115

T1000LE
1MB PCP48311U 75
2MB PCP48312U 110
4MB PCP42001U 225
8MB PCPA2002U 425

T1000XE
1MB PCP48311U 70
2MB PCP48312U 116

PORTABLE T1600
4MB PCPA2012U 230
8MB PCP42013U 425

T2000
1MB PC18PA8318U 70
2MB PCPA2000U 110
4MB PCPA2001U 200
8MB PCPA2002U 425

T2000SX
1MB PC18PA8318U 70
2MB PCP42000U 116
4MB PCPA2001U 205
8MB PCPA2002U 430

T2000SXE
2MB PCPA2000U 110
4MB PCPA2001U 220
8MB PCPA2002U 420

T2200SX
2MB PCPA2000U 110
4MB PCPA2001U 225
8MB PCPA2002U 420

T3300SL
2MB PCPA20006U 120
4MB PCPA20007U 220
6MB PCPA20008U 900

T4400SX
2MB PCPA2003U 180
4MB PCPA2004U 225
8MB PCPA2005U 420

T6400
2MB PCPA2003U 120
4MB PCPA2004U 229
8MB PCPA2006U 420

T1200XE
2MB PC13P48308U 180

T1800
2MB PC8PA8302U 125

T8100
2MB PC3PA7135E CALL

T3100E
512K PC9PA8340U 40
2MB PC8PA8341U 110

1x9 70NS $45
4x9 70NS $145

SIMM-SIPP MODULES

4MB X 9-80NS SIMM-PC	145	256K X 9-100NS SIMM	13	1MB X 9-70NS SIPP	50
4MB X 9-70NS SIMM	145	256K X 9-80NS SIMM	14	1MB X 9-60NS SIPP	53
4MB X 9-60NS SIMM	160	256K X 9-70NS SIMM	15	256K X 9-100NS SIPP	18
1MB X 9-100NS 9 CHIP SIMM	36	256K X 9-60NS SIMM	18	256K X 9-80NS SIPP	19
1MB X 9-80NS 3 CHIP SIMM	39	1MB X 8-80NS SIMM	41	256K X 9-70NS SIPP	20
1MB X 9-80NS 9 CHIP SIMM	44	1MB X 8-70NS SIMM	42	256K X 9-60NS SIPP	23
1MB X 9-70NS 3 CHIP SIMM	40	4MB X 8-80NS SIMM	150	256 X 36 – 1MB	50
1MB X 9-70NS 9 CHIP SIMM	45	4MB X 8-70NS SIMM	150	512 X 36 – 2MB	95
1MB X 9-60NS 3 CHIP SIMM	42	1MB X 9-100NS SIPP	43	1 X 36 – 4MB	159
1MB X 9-60NS 9 CHIP SIMM	48	1MB X 9-80NS SIPP	49	2 X 36 – 8MB	319
1MB X 9-53NS 9 CHIP SIMM	CALL			4 X 36 – 16MB	619
16MB X 9-70NS SIMM	660				

T3100SX
2MB PC15PA8300U 120
4MB PC15PA8310U 200

T8250
3MB PC8PA7137U 180

T3200SX
2MB PC12PA8307U 110
4MB PC12P48308U 210

T3200SXC
2MB PC18PA8318U 110
4MB PC12PA8310U 210

T6100
2MB PC7P48301U 120

T8200
2MB PCPA8304U 110
8MB PCPA8313U 815

T5200C
2MB PCPA8304U 110
8MB PCPA8313U 516

T8600
2MB PCPA8304U 110
8MB PCPA8313U 810

PAGELASER 6
2 4MB N80090 140
4MB N80100 200

EXPANSION BOARDS TOSHIBA
EXP BOARD
3-16MB 120
2MB 120
4MB 240

T1853, T1850C0, T1E00CT T4800, T4800C T1910CS T4700CS CT
4MBPC PA2012U 230
8MBPC P42013U 400
16MBPC PA2014U 900

T6600C T6600C/CO, T6600C/COV
4MBPC-PA2004U 225
8MBPC-PA2005U 425
16MBPC-PA2010U 905

T3400, T3400CT
4MBPC-PA2019U E80
8MBPC P42020U 400

AST

PREM EXC E00/12
1MB 500814001 $ 90
4MB 500814003 180

PREM EXC 0000X/20
1MB 500814001 90
4MB 500814003 180

PREM EXC 0000X/E0, /25C
1MB 500814001 $ 90
4MB 500814004 160

BRAVO 3/25s
2MB 500710004 200
8MB 500824002 350

BRAVO 4/25s(LC) 4/33(LC)
2MB 500987001 120
4MB 500987002 150
8MB 500987003 280
16MB 500987004 700
32MB 500987005 1300
4MB 500814004 180

BRAVO 286/8 /12
2MB 120
8MB 350
0 16MB 180

BRAVO 286/16
512KB 500510012 40
2MB 500510002 180
8MB 500824001 200

BRAVO 3800X/16
2MB 500510002 180
0 16MB 80

OKAVO 6000X/30
512kB 500510012 64
2MB 500510002 180
8MB 500824001 300

OKAVO 600/25
2MB 500780005 90
8MB 500780001 300

PREMIUM II 300/20
1MB 500780003 90
2MB 500780005 90
4MB 500780004 180
8MB 500780001 300
0 32MB 500819001 160

PREMIUM II 4A0/20
1MB 500780003 90
2MB 500780005 90
4MB 500780004 180
8MA 500780001 360
0-32MB 500819001 160

PREMIUM II 300/33
1MB 500780003 50
2MB 500780005 90
4MB 500780004 180
8MB 500780001 360
0 32MB 500818001 180

PREMIUM II 300 X/20
1MB 50078003 90
2MB 500780005 90
4MB 500780004 185
8MB 500780001 600
0 32MB 500818001 180

ADVARTARE 0000X/25
2MB 500862001 90
8MB 500862002 600

ADVARTADE PRO 6000X/33
2MB 500987001 180
4MB 500987002 170
16MB 500987004 700
32MB 500987005 1360

ADVARTARE PLUS 400DX/33 400DX2-00 -66
4MB 500510008 [illegible]
8MB 500824001 300

PKEMIUM II 400/3
1MA 500780003 90
2MB 500780005 90
4MB 500780004 180
8MB 500780001 410
0 32MB 500819001 180

PREMIUM II 4000X/20
1MB 500780003 90
2MB 500780005 90
4MB 500780004 160
8MB 500780001 410
0 32MB 500818001 150

PREMIUM 386SX/16
1MB 500780003 50
2MB 500780005 80
4MB 500780004 180
8MB 500780001 410
0 32MB 500818001 180

PREMIUM 4800X/33E
1MB 500780003 90
2MB 500780005 80
4MB 500780004 180
8MB 500780001 410
0 32MB 500818001 180

OFFICE ADVAR 380SX/20
2MB 500891001 180
8MB 500891002 600

OFFICE ADVAR 4000X/20
2MB 500891001 180
8MB 500861002 205

PREMIUM 6000X/33TE
1MB 500780003 90
2MB 500780005 90
4MB 500780004 180
8MB 500780001 410
0 32MB 500818001 180

PREMIUM 300
1MB 500510003 90
4MB 500510004 180

PKEMIUM 330C
1MB 500510007 90
4MB 500510008 300

PREMIUM 330/30TE
1MB 500780003 90
2MB 500780005 90
4MB 500780004 180
8MB 500780001 410
0 32MB 500816001 180

POWER EXEC EL
POWER EXEC 3/25SL, 25SL-C
2MB 500984004 180
4MB 500984001 210
6MB 500984002 300
16MB 500984003 1000

POWEK EXEC 4/25SL COLOR
4MB 501188001 220
16MB 501168003 1000

MARRATTER SMP SYSTEM
16MB 501143001 810

PREMMIA
4MB 501159001 180
8MB 501156002 370
16MB 501159003 710
32MB 501159005 1170
64MB 501156005 2000

PREMIUM SERVER SE 4/33
0 32MB 500819001 180
2MB 500780005 90
8MB 500780001 500

PREMIA LX P/60
8MB 500987003 380
16MB 501340002 740
32MB 500987005 1300

ADVARTAGE EXPLOKEK BRAVO R0
4MB 501255001 210

POWERREXEC 4/25SL SPECIAL EDITION POWEREXEC 4/33SL
4MB 500984001 180
16MB 500984003 1000

NEC

ULTRALITE 2A0F
1MB PC2221 $ 112
4MB PC2222 229

ULTRALITE SX/20
2MB PC4421 143
4MB PC4422 221

ULTRALITE SL/25
2MB PC4721 122
6MB PC4921 307

ULTRALITE SL/25P
2MB PC4721 122
6MB PC4921 337

ULTRALITE III
2MB PC4721 122
4MB PC4722 221
8MB PC4723 465

ULTRALITE SL/25C
2MB PC4721 122
4MB PC4722 221
6MB PC4723 465

PROSPEED 2A0
1MB PC2121 100
2MB PC2100 172
4MB PC2122 220

PROSPEED 386
2MB PC3121 180
8MB PC3122 643

PROSPEED 386SX
1MB PC2121 150
2MB PC2128 172
4MB PC2122 220

PROSPEED 6000X/20
1MB PC4021 100
4MB PC4322 220

PROSPEED 6000X 6000X/c
1MB OP4106204 70
4MB OP4106205 220

POWERMATE PORT SX
2MB APCH751X 183
8MB APCH753 784 443

POWERMATE PORT PLUS
1 3MB APCH750J 130
2 3MB 287
3MB [illegible]

POWERMATE SX
2MB APCH655 210
4 8MB APCH656 300
4MB 360

POWERMATE SX PLUS
1 2MB APCH656E 180
2MB 300
4-8MB 4PC882E 205
6MB 870

POWERMATE SX/16
2 8MB OP4106201 207
2MB OP4106103 140

POWERMATE SX/E0
2MB OP4108101 207
2 8MB OP4106201 237
2MB 200

POWERMATEE SX/16I SX/E0I /20VI /20C
2MB OP4108103 140
8MB OP4102101 443

POWERMATE 286C
POWERMATE 286 PLUS
1 3MB APCH250K 143
2 3MA 210
3MB 604

POWERMATE 386/E0
2MB APCH655E 801
8MB APCH656E 801

POWERMATE 386/20
2MB APCH655XE 263
8MB APCH65BX 800
6MB APCH657X 700

POWERMATE 386/25S
2MB OP4105201 200
4MB OP4105203 200
8MB OP4105202 872

POWERMATE 386/33E
2MB OP4105101 172

POWERMATE 386/33I
1MB OP4106204 70
4MB OP4106205 279
16MB OP4106208 800

POWERMATE 486/33I
2MB OP4108103 140
8MB OP4102101 443

POWERMATE 486/E0E
2MB OP4105101 172

POWERMATE EXPRESS 486/33E, /50E, 4000X/25E 4000X/25E
1MB OP4106204 70
4MB OP4106205 220
16MB OP4106208 600

POWERMATE EXPRESS TOWER 486/E5TE, /33TE, /50TE 4000X/EATE,
1MB OP4106204 70
4MB OP4106205 220
16MB OP4106208 295

POWERMATE EXPRESS/II SERIES 4330T 4060T
4MB OP41012002 220
16MB OP41012003 800
32MB 1810

POWERMATE EXPRESS/II P600T, P60L1
4MB OP41012002 220
8MB OP410030003 480
16MB OP41012003 810
32MB 1A32

SILENTWRITER MOREL 90 & 290
2MB 4002 187

SILENTWRITEK MODEL 00
2MB 95023 180

SILENTWRITER MODEL 2
2MB 4032 187

IMAGE 420,433,460 POWERMATE 420ES,433SS, 460ES READY 420ES, 443ES, 460ES
4MB OP41012002 280
16MB OP41012003 800

POWERMATE 286/12
2 16MB 180
4 16MB 299
8 16MB 480
2MB OP4108103 183

POWERMATE 320 READY 320
2MB 158082096090 180
8MB 158082182000 410

POWERMATE 420,433,460 READY 42E,433
1MB 802147606001A 70
4MB 158082232000 210
16MB 158082222000 840

POWERMATE SX/20
2MB OP4108100 240
2 8MB OP4108102 237
2MB OP4108103 297
2MB OP4108103 140

PORTARLE PLUS
2 16MB 180
4 16MB 3 290
8 16MB 440
1MB 90

ULTRALITER VERSA 20, 20C, 25, 25C 25CP 25P, 33 33C, 40E, 50E
4MB OP414001 (3 3 V) 250
8MB OP4104002 (3 3 V) 470

HARD DRIVES

Seagate

FACTORY NEW 1 5 YEAR WARRANTY

IDE				
130MB	ST3115A	15MS	3 5X1"	E16
128MB	ST9145AG	16MS	2 5"	260
260MB	ST3290A	16MS	3 5X1"	212
340MB	ST3381A	12MS	3 5"	240
209MB	ST9235AG	16MS	2 5"	345
452MB	ST3550A	12MS	3 5X1"	325
540MB	ST3655A	12MS	3 5"	365
SCSI				
452MB	ST3550N SCSI 2	12MS	3 5X1"	424
540MB	ST3655N SCSI-2	11MS	3 5X1"	448
340MB	ST3390N SCSI-2	12MS	3 5X1"	320
1 35GB	ST41600N	12MS	FH	1350
1 2GB	ST11200N SCSI-2	10MS	3 5"	796
1 2GB	ST31200N	9MS	3 5X1"	729
1 2GB	ST41200N	14MS	FH	859
2 1GB	ST42100N SCSI-2	14MS	FH	1300
2 1GB	ST42400 SCSI-2	11MS	FH	1450
3 6GB	ST43400N SCSI 2	10MS	FH	1879
1 7GB	ST11900N	9MS	3 5"	1058
1 7GB	ST11950N SCSI-2	6MS	3 5"	1477
2 1GB	ST12550N SCSI-2	8MS	3 5"	1650
2 2GB	ST12400N SCSI-2	12MS	3 5"	1395
4 1GB	ST15150N W	9MS	3 5"	CALL
8 0GB	ST410800N W	11MS	FH	CALL

CONNER

FACTORY NEW 1 YEAR WARRANTY

IDE				
170MB	CFA170A	17MS	3 5X1"	E179
210MB	CFS210A	12MS	3 5X1"	158
340MB	CFA340A	14MS	3 5X1"	286
420MB	CFS420A	14MS	3 5X1"	263
540MB	CFA540A	10MS	3 5X1"	355
SCSI				
170MB	CFA170S	13MS	3 5X1"	195
340MB	CFA340S	13MS	3 5X1"	260
540MB	CP30540 SCSI-2	10MS	3 5"	475
1 0GB	CP106 SCSI-2	10MS	3 5"	719

WESTERN DIGITAL

FACTORY NEW 3 YEAR WARRANTY

IDE				
212MB	WD1210	12MS	3 5X1	$205
250MB	WD2250	14MS	3 5X1"	218
270MB	WD1270	11MS	3 5X1"	CALL
340MB	WD2340	12MS	3 5X1"	246
420MB	WD2420	13MS	3 5X1"	274
540MB	WD2540	11MS	3 5X1"	372

MICROPOLIS

FACTORY NEW 5 YEAR WARRANTY

IDE				
1 0GB	2210A	10MS	3 5"	E735
1 75GB	2217A	10MS	3 5"	959
SCSI 2				
1 0GB	MC2210	10MS	3 5"	749
1 2GB	MC4110	9MS	3 5X1"	700
1 2GB	MC1598	15MS	FH	790
1 6GB	MC1908	10MS	FH	1099
1 75GB	MC2217	0MS	3 5"	940
2 0GB	MC1548	14MS	FH	1173
2 1GB	MC1928	11MS	3 5"	1349
3 6GB	MC1936	11MS	FH	1840
4 1GB	MC4410	8MS	3 5"	CALL
9 0GB	MC1991	11MS	FH	CALL

Quantum

FACTORY NEW - 2 YEAR WARRANTY ELS & LPS
5 YEAR WARRANTY ON P DRIVES
1 YEAR WARRANTY ON 2 5" DRIVES

CAPACITY	M/N	SPEED	SIZE	PRICE
127MB	ELS127A	17MS	3 5X1"	$180
170MB	LPS170A	17MS	3 5X1"	195
340MB	LPS340A	16MS	3 5X1"	330
540MB	LPS540A	10MS	3 5X1"	375
SCSI				
127MB	ELS127S	17ms	3 5X1"	180
170MB	LPS170S	17MS	3 5X1"	196
340MB	LPS340S	16MS	3 5X1"	285
540MB	LPS540S SCSI-2	10MS	3 5X1"	385
1 0GB	P1080S SCSI 2	10MS	3 5X1"	740
1 2GB	P1225S SCSI-2	10MS	3 5"	845
1 8GB	P1800S SCSI-2	10MS	3 5"	965

FUJITSU

FACTORY NEW – 5 YEAR WARRANTY

IDE				
520MB	M2624T	12MS	3 5"	309
SCSI				
1 2GB	M2694ESA	10MS	3 5"	745
2 1GB	M2654S	12MS	FH	1345

Maxtor

FACTORY NEW 2 YEAR WARRANTY

IDE				
130MB	7131A	14MS	3 5X1"	179
170MB	7171A	13MS	3 5X1"	168
273MB	7273A	12MS	3 5X1"	248
345MB	7345A	12MS	3 5"	245
540MB	7546A	10MS	3 5X1"	355
SCSI				
273MB	7273S	15MS	3 5X1	CALL
290MB	7290S	14MS	3 5X1"	280
345MB	7345S SCSI-2	12MS	3 5"	318
540MB	MXT540S	8MS	3 5X1"	450
1 2GB	MXT1240S SCSI-2	8MS	3 5"	1190

TOSHIBA

1 YEAR WARRANTY ON 2 5

[SUPER FAST SCSI 2]			
120MB	IDE MK1522FC	2 5"	$275
213MB	IDE MK2224FC	2 5"	375
213MB	SCSI MK2224FB	2 5"	300
340MB	IDE MK2326FC	2 5"	540
524MB	IDE MK2428FC	2 5"	775

HEWLETT PACKARD

FACTORY NEW 5 YEAR WARRANTY

SCSI				
1 0GB	C2247	10MS	3 5"	748
2 1GB	C2490	9 9MS	3 5"	1350

digital

FACTORY NEW FULL WARRANTY
DISK DRIVES FOR POWER USERS

SCSI II				
535MB	DSP3053L	8 5MS	3 5X1"	620
1 0GB	DSP3107L	9 5MS	3 5X1"	720
1 0GB	VP3107	8MS	3 5X1"	CALL
1 3GB	DSP3133L	8 5MS	3 5X1"	1040
1 6GB	DSP3160	8 5MS	3 5"	1065
2 1GB	DSP3210	9MS	3 5"	1370
2.2GB	VP3215	9MS	3 5X1"	CALL
3 5GB	DSP5350	12MS	FH	2205
4 0GB	DSP5400	12MS	FH	2452
4 3GB	SP3430	9MS	3 5"	CALL

ALL CREDIT CARDS ARE VERIFIED FOR FRAUDULANT USE HOURS MON-FRI 8 30-8 30 SAT 10 00-3 50 ORDERS FROM ANYWHERE IN THE USA OR CANADA CALL FOR CURRENT PRICES AND VOLUME DISCOUNTS PRICES AND AVAILABILITY SUBJECT TO CHANGE ORDER LINES OPEN 6 DAYS MINIMUM ORDER $50 00 USA SHIPPING AND HANDLING AIR $12 00 AIR OVERNIGHT $18 00 COD ADD $4 00 PA RESIDENTS ADD 7% SALES TAX PREPAID ORDERS CALL FOR CONFIRMATION ALL RETURNS REQUIRE RMA# AND ORIGINAL INVOICE CANCELLED ORDERS AND RETURNS FOR CREDIT SUBJECT TO 25% RESTOCKING CHARGE RETURNED MERCHANDISE MUST BE IN NEW CONDITION AND RECEIVED WITHIN 14 DAYS FROM INVOICE DATE SORRY NO REFUNDS AFTER 14 DAYS SHIPPING AND HANDLING CHARGES NOT REFUNDABLE INTERNATIONAL ORDERS WELCOME - APO – FPO — ORDERS WELCOME P.O S ACCEPTED FROM GOVERNMENT AGENCIES – UNIVERSITIES – FORTUNE 2000 COMPANIES – SUBJECT TO APPROVAL ALL MEMORY PRODUCTS ARE THIRD PARTY ALL TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS ALL MEMORY PRODUCTS ARE 100% GUARANTEED AND COME WITH LIFETIME WARRANTY EXCEPT 30 DAY WARRANTY ON CPUS AND ONE YEAR WARRANTY ON MOTHER BOARDS ALL HARD DRIVES ARE MANUFACTURERS WARRANTY ONLY

FOR MEMORY PRODUCTS NOT LISTED CALL FOR PRICES AND AVAILABILITY

CALL FOR LATEST SUPER PRICES **1-800-457-6937**

WORLDWIDE TECHNOLOGIES 437 Chestnut Street, Philadelphia, PA 19106.

INTERNATIONAL ORDERS WELCOME
- 215-922-0050 International Order Line
- 215-922-4640 Technical Support
- 215-922-0118 FAX • Domestic • International
- 800-457-6937 Order Line – TOLL FREE
- 800-636-6792 Government • Universities • Fortune 2000

Circle 251 on reader service card.

Imagine the Possibilities

The sky's the limit with Altima Systems' *new* **Virage** notebook. Made to order for you in over 300 notebook configurations, the Virage's modular design keeps up with your ever changing computer needs. Plus you can upgrade at anytime.

CPUs: SL Enhanced i486 SX/33, DX/33, DX2/50 or DX2/66

RAM: 4/8/16/20/32MB of RAM

Storage: 120, 200, 250, 340, and 524MB of Hard Disk storage.

Display: 9.5" Upgradeable LCD panels Mono, DSTN, and TFT

The **Virage** has digital audio sound on-board and is compatible with a Type III PCMCIA card. When you think of a notebook to fit your needs — think Virage. The possibilities are endless.

(800)356-9990

intel inside

altima

2440 Stanwell Drive, Concord, CA 94520 • Tel 510/356-6000 Fax 510/356-2400
©1994 Altima Systems, Inc. Virage is the trademark of Altima Systems. The Intel Inside Logo is a registered trademark of Intel Corporation.

If You Know What's Good For You, You'll Get Out Of Town Fast.

Hop on a bike. It's a great way to get the exercise you need to lower your risk of heart disease. *You can help prevent heart disease and stroke. We can tell you how. Call 1-800-AHA-USA1.*

American Heart Association

This space provided as a public service. ©1994, American Heart Association.

Take the Easy Way Out...

Envisions Always Gives You:

- THE LATEST TECHNOLOGY
- 100% 30-DAY MONEY-BACK GUARANTEE*
- IMMEDIATE AND EXPERT ANSWERS TO YOUR SCANNING QUESTIONS – BEFORE & AFTER YOUR PURCHASE
- LIFETIME TECHNICAL SUPPORT
- ONE-YEAR WARRANTIES ON ALL PRODUCTS – PLUS OPTIONAL EXTENDED WARRANTIES
- A COMPLETE LINE OF TOP-NOTCH SCANNING SOLUTIONS
- GREAT SOFTWARE BUNDLES – POPULAR FULL-VERSION APPLICATIONS AT LOW LOW PRICES
- THE BEST VALUES BY FAR

All Envisions Flatbed Scanners Come With:

DYNASCAN™ TWAIN

Our enhanced TWAIN Driver that ensures the best** color accuracy and improves image quality. DYNASCAN™ TWAIN lets you scan directly from magazines, newpapers, etc. without the usual image distortion. DYNASCAN™ TWAIN lets you scan anything directly into other applications – scanning is just a mouse-click away.

LIFETIME WARRANTY ON LIGHT SOURCE

FULL SPECTRUM LIGHT SOURCE WITH NO WARM UP TIME

For no-wait scans and accurate color recognition.

NEW ZERO WAIT STATE SCSI-2 INTERFACE WITH NO DMA OR IRQ

For screaming fast scanning and no conflicts with other devices such as CD-ROMs, modems, sounds cards, etc. Envisions ends configuration hassles!

DAISY-CHAINING CAPABILITY WITH OTHER SCSI-2 DEVICES (WITH OPTIONAL UPGRADE)

SUPER QUICK INSTALLATION PROCESS

You'll be up and scanning in about ten minutes!

PC Computing HARDWARE 200 FINALIST 1994

Computer Shopper Best Buy OF 1993

Computer Shopper Best Buy OF 1993

Winner of Computer Shopper's 1993 BEST BUY Award When Priced at $1799!

THE ENV24PRO

NOW ONLY

$999

- 600 X 1200 DPI OPTICAL RESOLUTION
- 2 MB I/O BUFFER FOR EXTREMELY FAST SCANNING
- FASTER SCANNING THAN THE HP II CX ON B/W, GRAYSCALE, AND COLOR SCANS

THE ENVCOLOR HANDSCANNER

$219

- 800 dpi
- 24-bit
- 16.8 M Colors
- 256 Grayscale & Line Art
- Graphics Software with Automerging Included

5 YEARS! CELEBRATING OUR 5TH YEAR OF PROVIDING SCANNER SOLUTIONS DIRECTLY TO YOU

FREE

With the ENV24Pro!

Your Choice of Full-Version Software For Desktop Publishing or Electronic Document Filing

Adobe PhotoShop 2.5™ Retail Value $895

Recollect Retail Value $595

100%* 30 DAY GUARANTEE MONEY BACK

*Except shipping & handling. No restocking fees for products returned in new condition.

Requirements: 386 or higher, Windows 3.1, 4MB RAM, 20MB free HD space, available ISA slot for included interface card. Windows, DS/2™ & Apple Macintosh® versions available.

ONLY AVAILABLE BY CALLING THE ENVISIONS SCANNER HOTLINE:

1-800-926-7226

QUESTIONS? WE LOVE QUESTIONS™ ANSWERS? WE'VE GOT ANSWERS!

LOCAL: 415/692-9061 FAX: 415/692-9064 BBS: 415/259-8145

ENVISIONS

Scanner Solutions Made Easy

Call ENVISIONS Today!

Scanner Solutions Made Easy

Direct Top 60 Vendor
PC Computing

Envisions Provides the Easiest Solutions For:

• Desktop Publishing • Text Scanning • Form Filling
• Image Processing • Business Card Scanning • Faxing
• Electronic Filing • You Name It

DYNAMIC PRO 30: THE SCANNER FOR PROFESSIONAL USE

You won't need a drum scanner anymore to get premium color scanning results. Our newest top-of-the-line flatbed scanner will give you professional quality scans at a very affordable price. Never has this level of performance been available at such a low price.

- Highest Dynamic Range of Any Scanner in its Class – for the Highest Color Accuracy
- **Built-in Transparency Scanning – No Add-ons Required!**
- 30-bit/1.1 Billion Colors
- 600 x 1200 Optical Resolution
- 2 MB Buffer

DYNAMIC PRO 30

$2999

FREE
With the Dynamic Pro 30
Full Versions of Adobe PhotoShop 2.5™ and Kai's Power Tools™ – A $1094 Value, FREE!

Purchase any Envisions Flatbed Scanner and Get **Xerox's** TextBridge 2.0 and CardScan for just $99. Retail Value, $248.

Scan Text & Business Cards for Just $99!

Choose the Scanner Solution that's Right for You:

	ENV6100	ENV8100	ENV24Pro	Dynamic Pro 30
Optical Resolution	300 x 600	400 x 800	600 x 1200	600 x 1200
Maximum Resolution	1200	1600	2400	2400
Buffer	128K	128K	2MB	2MB
Bits/No. of Colors	24-bit/16.8 M	24-bit/16.8 M	24-bit/16.8 M	30-bit/1.1 Billion
Single Light Source	Yes	Yes	Yes	Yes
Scan Window Size	8.5 x 14	8.5 x 14	8.5 x 14	8.3 x 11.7
Transparency Adapter	$499	$499	$699	Included
Auto Document Feeder	$399	$399	$399	N/A
PRICE	$499	$649	$999	$2999
Software Included	Image Folio for Scanning Graphics (add *Xerox's* TextBridge 2.0 for Text Scanning for just $69)		Full Version Adobe PhotoShop 2.5 or Full Version Recollect	Full Version Adobe PhotoShop 2.5 & Full Version Kai's Power Tools
THE BOTTOM LINE	The ENV6100 is the Low Price Leader Our ENV 8100 – Voted Best Color** – has Higher Resolution for Finer Details		Blazing Fast, Great Color, the Highest Resolution – Our Most Versatile All-Purpose Scanner	Outstanding for Professional Use Replaces Drum Scanners for Many Applications

Many Special Software Bundles Available. Special Offers on DTP and Office Automation Software Suites Also Available. Call Us for Pricing.

** Source: PC Computing, April, 1994

©1994 Envisions Solutions Technology, Inc.
All Rights Reserved. All Trademarks Acknowledged.
Prices and Specs Subject to Change.

ONLY AVAILABLE BY CALLING THE ENVISIONS SCANNER HOTLINE:

1-800-926-7226

QUESTIONS? WE LOVE QUESTIONS™ ANSWERS? WE'VE GOT ANSWERS!
LOCAL: 415/692-9061 FAX: 415/692-9064 BBS: 415/259-8145

BUT WAIT! THERE'S MORE!
CALL US TO GET YOUR
FREE FULL-COLOR CATALOG
CONTAINING OUR COMPLETE LINE OF
SCANNER SOLUTIONS.

Index PRODUCTS FEATURED IN THIS ISSUE:

For free information on these products, circle the corresponding reader service number on the reply card on page 303.

	PAGE	READER SERVICE
COMPUTER SYSTEMS		
486-BASED SYSTEMS		
HP Vectra VL2 4/100 Hewlett-Packard	68	616
Poly DX4-100C Polywell Computers	68	617
NOTEBOOKS—COLOR		
ThinkPad 755C IBM	76	620
PALMTOPS		
HP 200LX Hewlett-Packard	76	621
PENTIUM-BASED SYSTEMS		
Ace Power 586-90V/CD Axik Computer	182	676
Ambra TP90PCI Ambra Computers	180	675
Dell Dimension XPS P90 Dell Computer	188	677
Gateway 2000 P5-90 Gateway 2000	190	678
P90PCI PowerStation Micron Computer	192	679
Pantera 90 Zeos Int'l	202	682
Poly 586-90VL Polywell Computers	177	680
SST P5-90VL Sirius Systems Technology	198	681
TD-3 Personal Work Station Intergraph	315	694
SUBNOTEBOOKS		
Portégé T3600CT Toshiba America	62	614
VIDEO CONFERENCING SYSTEMS		
ProShare Personal Video System 200 Intel	59	611
Vistium Personal Video 1300 AT&T	59	612
PERIPHERALS		
HARD DRIVES—SCSI		
Seagate Elite 9 Seagate Technology	79	623
MONITORS		
ViewSonic 17 and 21 ViewSonic	315	695
MULTIMEDIA		
Closed Caption Decoder International Computers	315	692
CompuPhone Integrated Technology	315	697
Mirage Plantronics	315	696
WeatherBrief Plus WeatherBank	315	693
NETWORKING		
EtherWave AUI Transceiver Farallon Computing	106	637
Silver Streak AUI Connector Tut Systems	106	638
PRINTERS—12-PPM LASER		
LaserJet 4 Plus Hewlett-Packard	108	641
PRINTERS—COLOR		
microMarc Color Inkjet Texas Instruments	64	615
Xerox 4900 Color Laser Xerox	61	613
SCANNERS—GRAYSCALE		
OmniScan Caere	66	740
SCANNERS—COLOR		
PowerLook Umax Technologies	72	619
ScanMaker III Microtek Lab	72	618
SOUND CARDS		
SoundMan Wave Logitech	79	622
WINDOWS SOFTWARE		
ACCOUNTING/PERSONAL FINANCE		
FundPro 3.0 for Windows Manhattan Analytics	84	625
Reuters Money Network for Quicken Users Reality Technologies	84	626
AUDIO/VISUAL		
ScreenCam 1.1 for Windows Lotus Development	98	633
CAD		
DesignCAD 2D Windows 7.0 American Small Business Computers	94	631
CD-ROMs		
CompuServeCD CompuServe	349	700
Government Spending CD Publishing	349	702
Media Magazine Media Multimedia	349	701
National Geographic CD-ROM National Geographic Society	350	704
The Print Shop Deluxe CD Ensemble Broderbund Software	350	706
Sam and Max Hit the Road LucasArts	350	708
Time Almanac of the 20th Century Compact Publishing	350	703
USA Wars: World War II Compton's NewMedia	350	705
Wrath of the Gods Luminaria	350	707
COMMUNICATIONS		
Procomm Plus 2.0 for Windows Datastorm Technologies	86	627
DESKTOP PUBLISHING		
PagePlus 3.0 Serif	90	628
DRAWING		
FreeHand 4.0 for Windows Aldus	83	624
GRAPHICS/PRESENTATION		
ABC SnapGraphics 1.0 Micrografx	30	601
ChartMaker Aldus	30	603
INTERNET SERVICES		
Air 2.0 Spry	132	652
Internet Chameleon NetManage	130	650
Internet In a Box Spry-O'Reilly & Associates	132	653
Internet Membership Kit Ventana Media	106	639
Pathway Access 3.0 and Pathway Runtime 2.0 The Wollongong Group	132	654
The Pipeline The Pipeline	135	655
SuperTCP for Windows Frontier Technologies	130	651
MARKETING		
Scan/US Scan/US	88	750
MEMORY MANAGERS		
Multimedia Cloaking Helix Software	98	634
MULTIMEDIA		
Newscast for Windows Mainstream Data	315	691
NETWORKING		
LANstep 2.0 Hayes Microcomputer Products	105	636
PERSONAL INFORMATION MANAGERS		
Ecco Professional 2.0 Arabesque Software	108	642
REMOTE ACCESS		
Carbon Copy Microcom	230	689
Norton pcAnywhere Symantec	230	688
ReachOut Remote Control Pro Ocean Isle Software	230	690
Remote Power On/Off + Aux Server Technology	230	687
SCANNING		
OmniPage Professional 5.0 Caere	92	629
WordScan Plus 3.0 Calera Recognition Systems	92	630
UTILITIES		
Emergency Disk 2.0 for Windows, PC Tools 2.0, and SpeedTools 2.0 for Windows Central Point Software	30	604
DOS SOFTWARE		
OPERATING SYSTEMS		
MS-DOS Version 6.22 Microsoft	30	602
ONLINE SERVICES		
GENERAL		
America Online	140	656
CompuServe Information Service	140	657
Delphi Internet Service	161	659
Dow Jones News/Retrieval	161	660
GEnie	161	661
Prodigy	140	658
Ziff-Davis Interchange Online Network	161	662
DATABASES		
Audiophile Network	167	665
Dallas Remote Imaging Group	169	670
FedWorld	167	663
Greenpeace Environet	169	669
HouseNet	168	667
InfoBoard	168	668
Software Creations	167	664
Windows Online	168	666

Advertiser Index

For free information on these advertisements, circle the corresponding reader service number on the reply card on page 303-304.

	READER SERVICE	PAGE NO.
Acer America	*	**267-271**
Advanced Logic Research	142	**27**
ADI	173	**138-139**
AGFA	126	**255**
	168	**258**
Altima	*	**319**
Ambra Computer Corporation	*	**109-116**
AMDEK	193	**316**
American Small Business	166	**317**
America Online, Inc.	*	**227-228**
American Power Conversion	116	**184-187**
Arlington Computer Products	160	**272**
AST COMPUTER	*	**20-21**
	*	**196-197**
AT&T Global Information	*	**245-248**
AT&T Multimedia	145	**233**
ATI Technologies Inc.	112	**46**
Automap	117	**10**
Best Data	122	**181**
Borland International	113	**107**
	261	**16-17**
Colorado Memory Systems	184	**104**
Compaq Computer	197	**200-201**
	109	**22**
	185	**136-137**
	115	**4-5**
	148	**69-71**
Compuserve	135	**183**
Computability	*	**317**
Computer Book Club	*	**293-295**
Computer Discount Warehouse	131	**301**
	134	**302, 305**
Connect	210	**129**
Corel Corp.	180	**19**
	200	**63**
	172	**77**
Creative Labs	133	**351**
Dataviz	124	**82**
Dell Computer Corp.	*	**C5-C8**
	*	**87,89**
	*	**91, 93**
	*	**95, 97**
	*	**99-101**

	READER SERVICE	PAGE NO.
Delphi Internet Services Corp.	239	**127**
Delrina Technology	167	**60**
Deneba Systems, Inc.	175	**67**
Envisions	*	**320-321**
Epson	*	**12-13**
Everex	228	**262**
First Source International	*	**292**
Gateway 2000	*	**33-45**
Globalink, Inc.	226	**219**
Hayes Microcomputer Products	152	**147**
Hewlett Packard	*	**204-205**
	*	**80-81**
IBM Parts & Sales	*	**243**
IDEK	179	**225**
INMAC	*	**235**
Insight	103	**286**
Inspiration	151	**14**
Int'l Correspondence Schools	*	**273-275**
Intel Corp	*	**150-153**
Intergraph Corporation	127	**257**
Knowledgepoint	150	**26**
L.A. Trade	*	**276**
Lexmark (Input Technologies)	161	**236**
Lotus Development Corp	*	**28-29**
	*	**155-160**
Lucas Arts	140	**18**
Matrox Electronics	155	**241**
Megahaus	105	**282**
Microcom	136	**195**
	137	**78**
Microhelp	128	**221**
Microsoft	*	**2-3**
	*	**170-171**
	*	**102-103**
Microtek Lab, Inc.	186	**56-57**
Midwest Computer Works	108	**266**
Midwest Micro-Peripherals	237	**306-307**
	271	**308-309**
	273	**310-311**
	276	**312-313**
Mitsumi Electronics Corp.	*	**191**
Nanao	212	**73**
NEC	*	**C2-C4, 1**

	READER SERVICE	PAGE NO.
NEC	219	**217**
	182	**8-9**
NOTIS Systems, Inc.	195	**131**
NRI Schools	*	**283-285**
Okidata	118	**24**
	119	**25**
PC Zone	203	**290-291**
PCs Compleat	146	**287**
	147	**288-289**
Philips Consumer Electronics	*	**133-134**
Plextor	158	**348**
Polaroid	204	**199**
QMS	*	**237**
	*	**85**
Quantex	*	**11**
	*	**277-281**
Rand McNally	*	**117**
SAGER	*	**314-315**
Samsung Electronics	138	**65**
Shapeware	*	**74-75**
Sharp Electronics Corp	*	**189**
Smith Micro	233	**162**
Software Publishing	*	**193**
Tektronix, Inc	121	**223**
Texas Instruments	163	**164-165**
The Complete PC	144	**251**
Toshiba America, Inc.	215	**172-173**
UMAX	257	**231**
USA Flex	202	**300**
ViewSonic	170	**118-119**
VTech Industries, Inc.	196	**296-297**
VTech Industries, Inc.	*	**298-299**
Wacom	111	**54**
WordPerfect	*	**15**
Worldwide Technology	251	**318**
XEROX CORPORATION	177	**48**
Zeos Int'l	248	**50-51**
	265	**52**

FYI

Direct to You Section	**263-321**
PC/Computing Marketplace	**324-345**

PC Computing

Marketplace

Advertising Account Representatives

Thomas Koletas	Southeast Territory	212-503-3674
Kevin Tracey	Northeast Territory	212-503-5102
Jonathan Schwartz	Northwest Territory	212-503-5101
Thomas Lee	Southwest Territory	212-503-5114
Erik Matlick	Midwest Territory	212-503-5142

National Advertising Staff 1-800-825-4237

Robert A. Bader VP, Central Advertising
Thomas Koletas Asst. Sales Manager
Bessi Dion Asst. Prod. Manager
Tricia Maguire Sr Ad Coordinator

Windows/Premier

The color showcase that puts the spotlight on leading-edge PC products and services.

324-334

Classified

Flexible-format display advertising: computer systems, components, software and more.

335-345

Index

	Premier	Classified
HARDWARE		
Boards/Components/Chips	326	335
Communications	326	337
Voice Mail		
Computer Systems	327	337
Input/Output Devices	328	
Bar Coding		338
Mass Storage Devices	328	
Midi		
Networking		
On-Line Services	328	338
Security		
SOFTWARE		
Business Applications	329	338
Communications		339
Education	330	339
Graphics/Design	331	339
Multi-media/CD-Rom	331	340
Personal	332	
Foreign Languages		
Public Domain		341
Scientific		
Security		
Shareware		341
Systems/Languages		
Utilities	333	
Adult		343
Entertainment		
Windows	332	
SUPPORTING PRODUCTS		
Accessories		
Digital Output Services		309
Disk Duplication		310
Information Resources	334	341
Services		
Supplies	334	342

Only one CD-ROM puts multimedia to work for you again and again and again...

Nautilus CD

The Monthly CD-ROM for Multimedia

Order NautilusCD Now! 1-800-637-3472

Now only twice! $6.95 a month

Each month, NautilusCD brings you hot multimedia and software designed to unleash the power of your multimedia computer and free you to do essential computing.

Is your system software up-to-date? Find out now! Do you have the latest anti-virus software upgrade? It's here! Do you want to expand your computing horizons? Multimedia tutors show you how!

Hundreds of software tools, utilities and resources are explained and instantly accessible on every monthly issue:

- Vital system software
- Informative multimedia articles and tutorials
- Great software tools, utilities and resources
- Premier multimedia product demos and reviews
- State-of-the-art multimedia entertainment and games

NautilusCD is yours for only $6.95 each month or $79.95 for one year. To order, call 1-800-637-3472, toll-free. International callers, dial 614-766-3165.

PCCLH

CIRCLE 401 ON READER SERVICE CARD

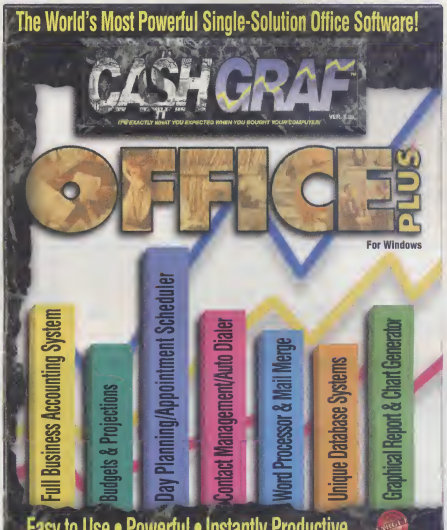
"GET A GRIP" On Your Accounting Plus All Your Office Needs!

From Our Family of Award Winning Products!

FREE!
Demo/Training Video (a $29.95 Value), Brochure & Even A Free Bag of Act II Popcorn!
1-800-872-4899

Available at Dealers Nationwide

Toll Free Customer Support



$199.95
CA$HGRAF OFFICE*PLUS*

- Full Business Accounting
- Perpetual Inventory, Purchase Orders
- Accounts Payable & Accounts Receivable
- Graphical Report & Chart Generator
- Day Planning/Appointment Scheduler
- Financial Calendar
- Contact Management/Auto Dialer
- Word Processor & Mail Merge
- Unique Database Systems
- Budgets & Projections

$89.95
CA$HGRAF WORKS*PLUS*

- Income & Expense Tracking
- Graphical Report & Chart Generator
- Day Planning/Appointment Scheduler
- Financial Calendar
- Contact Management/Auto Dialer
- Word Processor & Mail Merge
- Unique Database Systems
- Budgets & Projections

$39.95
CA$HGRAF CHECKS*PLUS*

- Exclusive Checks & Deposits
- Powerful Investment & Portfolio Tracking
- Budgets & Projections
- Day Planning/Appointment Scheduler
- Unique Electronic Card File
- Graphical Report & Chart Generator

TARGET SOFTWARE GROUP, INC. • 2901 58TH AVE. N. • ST. PETERSBURG, FL

CIRCLE 402 ON READER SERVICE CARD

PREMIER

NEVADA COMPUTER

SUMMER CLEARANCE

4X9-70NS (4 MEG) $139
420MB HARD DRIVE $258

Your choice of Conner, Western Digital or Seagate

HARD DRIVES

Seagate

MODEL	SIZE	SPEED	TYPE	PRICE
ST3290A	260MB	15MS	IDE 3 5"	$228
ST3391A	340MB	12MS	IDE 3 5"	$248
ST3491A	420MB	12MS	IDE 3 5"	$268
ST3655A	545MB	12MS	IDE 3 5"	$398
ST3600N	525MB	10MS	SCSI 2	$478
ST12550N	2100MB	9MS	SCSI	$1698
ST31200N	1050MB	10MS	SCSI	$789

CONNER

MODEL	SIZE	SPEED	TYPE	PRICE
CFA210A	210MB	15MS	IDE	$198
CFA340A	340MB	12MS	IDE	$249
CFA420A	420MB	12MS	IDE	$288
CFA540A	540MB	12MS	IDE	$348
CFA610	810MB	12MS	IDE	$595
CFA1000A/S ..	**1060MB**	**10MS**	IDE/SCS	**$478**

Maxtor

MODEL	SIZE	SPEED	TYPE	PRICE
7290A	290MB	15MS	IDE	$238
7345A	345MB	14MS	IDE	$258
7540A	**540MB**	**12MS**	**IDE**	**$300**

MICROPOLIS

2217 (3 5)	1750MB	10MS	SCSI/IDE	$1075
1548 (FH)	1748MB	14MS	SCSI	$1075
1926 (FH)	2100MB	11MS	SCSI	$1588
1936 (FH)	3300MB	11MS	SCSI	$2138
4110	**1000MB**	**10MS**	**SCSI/IDE**	**$700**

WESTERN DIGITAL

1210	212MB	13MS	3 5" IDE	$204
1270	270MB	12MS	3 5" IDE	$238
2340	340MB	12MS	3 5" IDE	$269
2420 ..	**425MB**	**12MS**	**3.5"IDE**	**$258**
2540 ..	**540MB**	**12MS**	**2.5"IDE**	**$408**

Quantum

LPS270A/S	270MB	12MS	IDE/SCSI	$243
LP340A/S	340MB	12MS	IDE/SCSI	$308
LPS540A/S	540MB	12MS	IDE/SCSI	$398
LPS1080A/S	1030MB	10MS	IDE/SCSI	$748
LPS1225	1200MB	10MS	SCSI	$898

PROCESSOR UPGRADES

Cyrix

286 (6 16 MHZ)	EVER (IBM 486SLC2 50MHZ)	$288
386SX 16 &20 (X2)	EVER (TISXLC2 20/40 MHZ)	$248
386SX 20 MHZ (X2)	CYRIX (486SRX2 20/40 MHZ)	$248
386SX 25 MHZ (X2)	EVER (IBM SLC2 25/50 MHZ)	$328
386SX 33 mhz (X2)	EVER (IBM SLC2 33/66 MHZ)	$378
386DX 16 MHZ (X2)	CYRIX (486DRX2 16/32 MHZ)	$238
386DX 16 & 20 (X2)	EVER (TI SXL2 20/40 MHZ)	$278
386DX 20 MHZ (X2)	CYRIX (486DRX2-20/40 MHZ)	$268
386DX 25 MHZ (X2)	EVER (TI SXL2 25/50 MHZ)	$328
386DX 25 MHZ (X2)	CYRIX (486DRX2-25/50 MHZ)	$308
386DX 33 MHZ (X2)	EVER (IBM 8 LIGHTNING 33/66)	$498
386DX 33 MHZ (X2)	CYRYX (486DRX2 33/66)	$338
386SX 16 MHZ (X3)	EVER (IBM 8 LIGHTNING-16/48)	$398
386SX 20 MHZ (X3)	EVER (IBM 8 LIGHTNING 20/60)	$478
386SX 25 MHZ (X3)	EVER (IBM 8 LIGHTNING-25/75)	$498
386SX-25MHZ (X2)	CYRYX (486SRX2 25/50)	$258
386DX 16 & 20 (X3)	EVER (IBM 8 LIGHTNING-20/60)	$398
386DX 25 MHZ (X3)	EVER (IBM 8 LIGHTNING-25/75)	$478
386DX 33 MHZ (X3)	EVER (IBM 8 LIGHTNING 33/99)	$698

COPROCESSORS

intel

80386 MACHINES		8088 MACHINES	
80387 16MHz	$44	8087 3 5MHz	$44
80387 20MHz	$54	8087-2 8MHz	$48
80387 25MHz	$59	8087-1 10MHz	$78
80387 33MHz	$69	**80286 MACHINES**	
80387DX	$74	80287-6MHz	$19
80387 SX16	$48	80287 8MHz	$24
80387 SX20	$54	80287 10MHz	$49
80387 SX33	$84	80287 XL	$54
80387SL	$79	80287 XLT	$78
Cyrix 83D87 33MHZ	$28	83S87 25MHZ (SX)	$39
83D87 40MHZ	$58	83S87 33MHZ (SX)	$58

CPU'S

intel

		80486 DX 2/66	$298
		80486 SX/25	$78
80486 DX/25	$188	80486 SX/33	$98
80486 DX/33	$264	PENTIUM 60	$698
80486 DX4/100	$668	PENTIUM 66	$798
80486 DX/50	$348	PENTIUM 90	$976
80486 DX 2/50	$288	CPU COOLING FAN	$9

MEMORY BELOW WHOLESALE COST

Laser Printer Memory

MODULE	1MEG	2MEG	3MEG	4MEG	5MEG	8MEG
Canon LBP4 4 Lite & 4+	$108	$144				
Epson Action Laser II, 6000	$108		$194		$268	
Epson + 6000 and many more		$118		$198		
Epson Action Laser 1000 & 1500		$138		$276		$399
HP Deskjet 500 500C and520 520C 550C 560 560C $38 (256K)						
HP 2 30		$98		$164		
HP 3 30 3P 2P 2P+		$98		$168		
HP Laser Jet 4 1115i, XL300, 1200C		$84		$174		$348
IBM Laser 4019 4019E (3 5MB)		$114		$164		
IBM Laser 4029 ALL MODELS		$95		$155		
OKI 400	$68	$94				
OKI 800 820		$148		$186		
Panasonic 4410/4430		$118		$174		
Panasonic 4420/4450		$118		$178		
Panasonic 4450	$105					
Panason c 4455		$129				
TI XL/PS17/PS35	$44			$98		

SIMM MODULES

30 PIN SIMM MODULES

DESCRIPTION	100NS	80NS	70NS	60NS	53NS	40NS
256X9	$9	$12	$15	$17		
1MEGX3		$37	$38	$44	$49	$64
1MEG X 9	$34	$39	$42	$49	$64	$78
4MEG X 9		$137	$139	$149		
16 MEG X 9			$798			
72 PIN SIMM MODULES						
512X36 2MEG		$78	$84	$98		
1X36 4MEG		$158	$168	$198		
2X36 8MEG		$339	$348	$398		
4X36 16MEG		$848	$664	$738		
8X36 32MEG			$1475	$1575		
16X36 64MEG			$2930			

WE HAVE LOWEST PRICES CALL!

CACHE MEMORY

	15ns	20ns	25ns		15ns	20ns	25ns
8KX8	4 95	4 45	3 95	64x4	10 00	5 95	4 95
32X8	7 95	6 75	6 55	16x4	6 95	5 45	4 95
64x1	10 95	6 05	5 95	128x8		28 00	28 00

COMPAQ Memory

MODEL	MEMORY	PART#	PRICE
Deskpro 286E 386 20 20E 25 25E	1MB	113131 001	$59
	4MB	113132-001	$178
Deskpro 386S	4MB Board	113634 001	$254
	4MB Module	112534 001	$170
Deskpro 386 20E 25E	4MB	113645-001	$238
Deskpro 386/33/33l 486/25 33L,50L, Systempro	2MB	115144-001	$98
	8MB	116561-001	$378
	32MB	116568-001	$1458
Systempro, Deskpro 6 SKT EXP BRD W/2MB		116569-001	$288
Compaq "M"	2 64MB	129160-001	$168
Deskpro 286N 386N 386SX/20 20N Portable 486c Deskpro M			
Systempro LT Series 129160-001 Pro Signia	1MB	118688 001	$49
	2MB	118689 001	$84
	4MB	118690-001	$178
	8MB	128877-001	$348
Prolinea 3/25 & 25Z	2MB	141738 001	$88
	4MB	141742-001	$318
Prolinea 4/25s 4/33 4/50	4MB Module	141684-001	$178
	8MB Module	141685-001	$338
Compaq Pro Signia	14MB	149320-001	$684
	32MB	149147 001	$1524
DeskPro 5/60 5/66M	8MB	149911 001	$388
Prosignia PC Server 486/33/64	8MB	141685-001	$348
	16MB	149320 001	$848
	32MB	149147-001	$1498
Prosignia 5/60	14MB	149949-001	$738
Proliant 100 5/60	32MB	149912-001	$1398
Proliant 2000 4/30 5/68	64MB	149913 001	$2698
Proliant 6000 4/50 5/68	128MB	149914 001	$5600

Compaq Laptop & Notebook Memory

Concerto 486 4MB $198 8MB $388 16MB $798

Contura 320 325 C	4MB	139498 001	$174
	8MB	139499 001	$318
Contura 4/25CX	4MB	146520-001	$178
	8MB	146521 001	$338
	18MB	146532-001	$748
SLT/286	1MB	110235-001	$75
	4MB	110237-001	$218
SLT386	4MB	118305-001	$198
Lte 286	4MB	117081-004	$178
Lte 386S/20	4MB	121125-002	$208
Lte Lite/20, 25, 25C	2MB	129769-001	$138
	4MB	129769-002	$208
	8MB	129769 003	$388
	16MB	129769 004	$808
LTE Lite 486/25C	4MB	142337 002	$178
	8MB	142337 003	$348
	14MB	142337-004	$768
Aero 3 3volt	4MB	190532 001	$218
	8MB	190597-001	$398

IBM PS/2 Memory

MODEL	MEMORY ..	PART#	PRICE
AMBRA Enterprise 486 Hurdle 486 Sprinta 486 (all models)	4MB	N/A	$168
	18MB	N/A	$648
PS/1 and 386/SX (2121)	2MB	92F9935	$80
	4MB	92F9694	$148
PS/2 30/286,25/286 Adpt Brd 1497259	512K	30F5348	$35
	2MB	30F5360	$80
PS/2 35SX LS 40SX 70 E61 061 121 Adpt Brd 6450609 34F3011, 34F3077 502 55SX 655SX P70 55LS 65LS X Station 120 & 130	1MB	6450603	$39
	2MB	6450604	$84
PS2 30 50Z, 55SX, 60, 65SX	2 8MB	1497259	$198
	2 14MB	6450609	$348
PS/1 Consultant Essentials & Expert models x43 x44 & PS/Valuepoint all models except Cxx series	4MB	96F9290	$194
	14MB	96F9291	$638
PS/2 70-A21, A61, 821, 861 PS/1 Consultant Essential & Expert models x11, x13 & x14 PS/Valuepoint Cxx series	1MB	6450603	$39
	2MB	6450608	$84
PS/2 35SX LS 40SX 55SX LS, 65SX	4MB	34F2933	$178
PS/2 90 XP 95 XP P75 (Pers) 54 57 (all) 76 77 PS/1 Pro 2123	2MB	6450902	$75
PS2 90 95 XP P75 (Pers) 56 57 (all) PS/1 Consultant, Essential Expert x11 x13 & x14, PS/1 Pro 2123, RS/6000	4MB	6450128	$174
	8MB	6450130	$338
PS2/2 35SX LS, 40SX	8MB	6450129	$338
PS2 70's and 80's	2 8MB	6450605	$297
32 BIT BOARDS	2 14MB	34F3077	$225
32 BIT BOARDS	4 14MB	34F3011	$318
PS/2 80-A21 A31, A61	4MB	6451060	$188
PS/2 80-061	1MB	6450375	$78
PS/2 80-111 311 121 321 081 161	2MB	6450379	$94

IBM Laptop Memory

Thinkpad 300 Ambra Treka	2MB	33G9288	$128
	8MB	33G9289	$368
Thinkpad 350 350C	8MB	6060378	$358
	14MB	6060379	$448
Thinkpad 500	4MB	53G6959	$228
	4MB	53G6960	$449
CL57SX, Thinkpad 700 700C 720 720C	4MB	07G1420	$208
Thinkpad 710T 750 750C	8MB	07G1421	$378
	14MB		$998
PS/Note N45SL	2MB	92F8804.	$108
PS/2 Model N51 Notebook SLC, SX	2MB	07G1826	$98
	4MB	07G1827	$188
	8MB	07G1828	$418
Laptop N33SX L40SX & PSNOTE 182	2MB	79F0999	$98
	4MB	79F1000	$184
L40SX, PSNOTE 182 ONLY	8MB	79F1001	$348

800-982-2946

For U.S. and Canadian Orders only

HOURS: M-F 7AM-5PM / SAT 10AM-3PM PST

TECHNICAL & CUSTOMER SERVICE CALL:
(702) 294-0204

PURCHASE ORDERS & INTERNATIONAL ORDERS FAX TO: (702) 294-1100

TERMS: SHIPPING UPS (Min $8 25) Shipping charges are non refundable Purchase orders from Universities, Fortune 2000 & Government Agencies, NET 30 on approval COD add $5 00 (Cashiers check) **CONDITIONS:** 20% Restocking Fee on refunds within 30 days No refunds or exchanges after 30 days · WARRANTY REPLACEMENT ONLY. ALL PRICES FINAL PRICES SUBJECT TO CHANGE Mfg part #'s for convenience only Trademarks are registered with their respective Co's 386, 387, 287, SX, are trademarks of Intel Corp *ONE PER CUSTOMER

FEDERAL EXPRESS · AIRBORNE EXPRESS · UPS

VISA · DISCOVER

684 Wells Road
Boulder City, NV
89005

AD # PCC 994

NEVADA COMPUTER

CIRCLE 403 ON READER SERVICE CARD

Thinking of Bar Codes ...

Think Videx!!

If you need a quality bar code reader small enough to fit in the palm of your hand, Videx has a bar code reader for you.

The TimeWand I offers credit-card sized portability, ideal in time and document tracking applications. The rugged DuraWand can take the punishment typically found in delivery and security applications. The TimeWand II offers the durability and computing power necessary in applications ranging from hospital patient care to warehouse inventory.

Call today to receive a free information kit on Videx portable bar code readers.

1105 N.E. Circle Blvd., Corvallis, OR 97330
503-758-0521 • Fax 503-752-5285

Videx

Videx, TimeWand, and DuraWand are registered trademarks of Videx, Inc. GCO462A

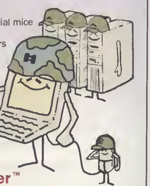
CIRCLE 404 ON READER SERVICE CARD

Control up to four PCs or file servers with just 1 keyboard, monitor and mouse!

Get the same great features of our AutoBoot™ Commander in a smaller, more 'personal' size. Measuring under 8" across, the Personal Commander™ lets you work smarter in cramped areas!

- Supports all 100% IBM compatible PCs; Optional Macintosh and Sun workstation support available
- KeyScan™ feature allows for keyboard-controlled channel scanning and switching
- Built-in support for PS/2 and serial mice
- AutoBoot feature boots computers without operator intervention

To control over four PCs, Macs or Sun workstations, ask for our AutoBoot Commander!



Personal Commander™

Cybex Corporation
4912 Research Drive • Huntsville, AL 35805 USA
(205) 430-4000 • FAX (205) 430-4030

CYBEX™

IBM is a trademark of International Business Machines Corporation. Macintosh and Sun are registered trademarks of their respective companies.

Dealer Program Available **Made in USA**

CIRCLE 405 ON READER SERVICE CARD

TARGET YOUR PREY!

Bag Your Voice Processing Objective

- VOICE MAIL
- AUTO-TRANSFER
- FAX-ON-DEMAND

Complete your mission for as little as $295.

CALL 1-800-846-4884

510-522-3800 • FAX 510-522-5556

We target developers/OEMS

TALKING TECHNOLOGY, INC.
1125 Atlantic Ave. • Alameda, CA 94501

CIRCLE 406 ON READER SERVICE CARD

BOLD IMAGES! BIG RESULTS!

Premier wins proven results for advertisers whose messages stand out in affordable full color. Place your ad where image makes all the difference—with 875,769 Business Computing Experts who spend over $100,000 a year on PC hardware, software, and services!

PC/COMPUTING PREMIER

800-825-4237

SMR PENTIUM NOTEBOOKS

Everyone is talking about PENTIUM while SMR is shipping them. We specialize in providing cutting edge technology for professionals who demand quality and dependability. This multimedia ready PENTIUM notebook is the latest and most powerful addition to our line of mobile computers.

- Up to 520MB HD 810MB Soon
- Up to 40MB RAM

To order or for further information, please call...

800 365-5761

SMR Computer Services, Inc.
26941 Cabot Road, Laguna Hills, CA 92653

CIRCLE 408 ON READER SERVICE CARD

How to make powerful new connections in 10 seconds. Or less.

The new Adaptec® SlimSCSI™ host adapter instantly connects your PCMCIA-ready notebook or PDA to SCSI-based peripherals, including the latest CD-ROMs, tape drives, and scanners. It's the quickest way to tap into your database or add some pizazz to your presentations, no matter where you are.

Getting started is just as quick. SlimSCSI comes bundled with SCSIworks!™, the DOS/Windows software that makes it easy to load drivers for the peripherals you're using.

Ask your dealer for Adaptec's latest IOware® product, the new SlimSCSI host adapter. Or, for PDAs and notebooks with parallel port connections, ask for Adaptec's MiniSCSI™. For more information about either product, call 1-800-934-2766 (1-408-957-7150 for information by fax).

They're great ways to make new connections. Fast.

adaptec®
NOW MORE IMPORTANT THAN EVER

Copyright © 1994 Adaptec, Inc. All rights reserved. Adaptec, the Adaptec logo, SlimSCSI, and IOware are trademarks of Adaptec, Inc., and SCSIworks® and MiniSCSI are trademarks of Trantor Systems Limited, an Adaptec company, all of which may be registered in some jurisdictions.

CIRCLE 407 ON READER SERVICE CARD

3-D At Prices That'll Jump Right Out At You!

The remarkable affordability of our 3-D gear —with patented StereoTek—is no illusion. In fact, with a complete line that starts at $1,195, you might say it's priced to move. Everything comes with a 30-day money back guarantee. And comfortable, light-weight, passive glasses that cost virtually nothing. Call today for a free brochure, 800-TEK-VIEW, extension 5000.

CIRCLE 409 ON READER SERVICE CARD

FREE CBSI 486 Business Computer

Earn $4,000 Per Month From Your Home With A Computer!

Quit spending money on your computer and let it earn money for you. This is a proven turnkey business an individual or couple can run. If you purchase our software and business program, we will give you the computer and printer. If you already own a computer, you may receive a discount. Begin part-time and still retain the security of your present position. Financing available.

To receive free cassettes and color literature, call toll-free:

1-800-343-8014, ext. 427

(in Indiana: 317-758-4415) Computer Business Services, Inc.

Next Step In User Convenience!

STEP ON IT!

KEYBOARD CONTROL PEDALS

Take the strain off your hands. Unique foot pedals mimic CONTROL, ALT, SHIFT or other keystrokes of your choice!

- For flight simulators
- For injured and disabled
- DOS/Windows

Limited Time Introductory Offer!

3 Pedals for $69.95

Regularly $89.99

To Order Call 1-800-203-0092

Bilbo Innovations, 2701 University Ave. Suite B, Madison, WI 53705
Fax 608-233-8397, E-Mail 588@BILBO.BOY.COM

CIRCLE 411 ON READER SERVICE CARD

Bright color. Bright price.

$2,599.

SPECIAL OFFER!

The BOXLIGHT 1285 ColorShow Projection Panel. Our brightest true-color panel. And for $950 off the list price, it's an unbeatable value.

- Compact, easy-travel panel
- 640 x 480 resolution
- PC and Mac compatible
- FREE remote and cables

Your direct source for all the bright answers.

- Widest selection
- Instant availability
- Overnight shipping
- 30-day guarantee

BOXLIGHT®

17771 Fjord Dr. N.E., Poulsbo, WA 98370
206/779-7901 • Payment: Visa, MasterCard, American Express, COD and Purchase Orders (some restrictions). Leasing and rental options available. 30-Day Money-Back Guarantee

Call Today 1-800-497-4007

CIRCLE 410 ON READER SERVICE CARD

BEST 9-TRACK TAPE SOLUTION OF THE 90'S!

- PC 286/386/486
- RISC/6000 • AS/400
- SUN • HP • DEC • APPLE

Our name begins with Quality!
Call us today for price and information.

QUALSTAR®
6709 INDEPENDENCE AVE.
CANOGA PARK, CA 91303
FAX (818) 592-0116 • (818) 592-0061

CIRCLE 412 ON READER SERVICE CARD

Top 10 List

Why buy a Mobile Hard Drive

10. Plug N' Play with just about any PC, printer port, SCSI, EPP & PCMCIA
9. 5X more rugged than hard drive
8. Fits in your hand, travel ready
7. Runs as fast as your computer allows
6. Buy one drive but use with many PCs
5. Not obsolete when you buy a new PC
4. Does it all - storage, backup, transport, security & more!
3. Carry your software & data anywhere
2. It's a bargain for its utilities
1. *Fixed disk is so boring!*

420MB starting at only **$399**

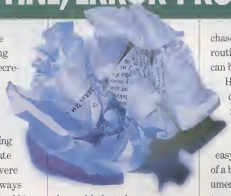
Other Capacities Available

1-800-873-VALU
FAX 408/437-9333

Value stor

CIRCLE 413 ON READER SERVICE CARD

IT ALL STARTED WITH TEDIOUS, ROUTINE, ERROR-PRONE DOCUMENTS.



For years, people endured the frustrating task of creating and recreating routine documents. Cutting a name here. Pasting a date there. Endless editing and proofreading to insure that inaccurate pronouns and names were corrected. (And not always successfully, we might add.)

It was time for intelligent template™ software that would dramatically reduce the time and effort needed to create those routine documents. Of course, it would have to be sophisticated enough to handle complex documents, yet be simple enough for even a beginner to use.

It was time for HotDocs.™

Suddenly, contracts, proposals, purchase orders—in fact, every routine business document—can be automated with HotDocs without the difficult chore of creating macros to replace names, dates and such.

And HotDocs is easy to use. With just the click of a button, you can turn a document into an intelligent template that can identify variables, prompt the user for input and then revise the document—all automatically. You can even share the template with others.

It's a revolution of sorts. A revolution that can save you time, money and, most of all, your sanity. And those crumpled documents at the bottom of your trash? They're history.

Use HotDocs to create intelligent templates for all of these documents and more:

Memos	Agreements	Bids
Requests for proposal	Contracts	Powers of attorney
Purchase orders	Applications	Wills
Invoices	Work authorizations	Inventories
Routine reports	Leases	Eviction notices
Affidavits	Proposals	Price quotes

ONLY $99

Order your copy of HotDocs for only $99. Call (800) 500-DOCS. 30-day money back guarantee included.

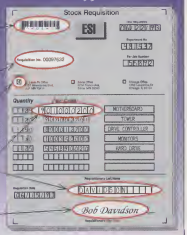
CAPSOFT DEVELOPMENT

© Capsoft Development Corporation 1994. All rights reserved. Capsoft is a trademark of Capsoft Development Corporation within the United States and other countries. HotDocs and Intelligent Template are trademarks of Capsoft Development Corporation. All other brand and product names are trademarks of their respective companies.

CIRCLE 414 ON READER SERVICE CARD

Automated Data Collection

Fast • Accurate • Efficient



BAR CODE
for product number, territory code, form ID, etc

O C R (TYPE PRINT)
for preprinted job code, order number, form ID, etc

CHECK MARK
for multiple choice, rating, true/false, etc

I C R (HAND-PRINT)
for name, address, date, time, social security and phone numbers, etc

IMAGE CAPTURE
for signatures, pictures, drawings, etc.

AutoData PRO™ II

Desktop Forms Processing for Windows 3.1

AutoData PRO II automatically reads and processes data from scanned or faxed forms. Your data can be exported to one of many popular file formats. Choose from a variety of desktop scanners to meet your needs. 30-Day Money Back Guarantee.

A Windows 3.1 DLL is Available for Developers

AUTO DATA SYSTEMS
A Unit of Electro-Sensors, Inc

AutoData Systems
6111 Blue Circle Drive • Minnetonka, MN 55343
Phone: 612/938-4710 • FAX: 612/938-4693
Toll Free: 800/662-2192

CIRCLE 415 ON READER SERVICE CARD

For the 160,000 who waited . . .

It's here for Windows™

If you didn't wait
. . . the switch is on!

To order call
1-800-267-0668

HavenTree SOFTWARE

HavenTree Software Limited P.O. Box 470 Fairview, NY 13640 Tel (613)544-6035
EasyFlow® is a registered trademark of HavenTree Software Limited. Windows™ is a trademark of Microsoft Corporation.

CIRCLE 416 ON READER SERVICE CARD

ONLY ONE THING COULD BE EASIER THAN OUR BAR CODE PRINTING SOFTWARE.

StrandWare offers you a full line of easy to learn, easy to use bar code printing software packages. In less than an hour, you can be printing most popular bar codes with virtually any printer. We also offer Bar Code Library, which lets you print bar codes from within your own programs. Call (800) 552-2331 or fax (715) 833-1995.

StrandWare
For Anyone Who's Keeping Track

CIRCLE 417 ON READER SERVICE CARD

Let our M.O.M. run your mail or phone order business!

If you're a catalogue, wholesaler, distributor, retailer– anyone selling products and services by phone or mail—get complete control of your business with Mail Order Manager. The #1 Choice of direct marketers nationwide, M.O.M. gives you everything you need—order entry/review, credit card processing, UPS shipping, inventory, profit analysis, accounting, telemarketing, list management – all in one powerful integrated program! (dBase III+ files. Single and multi-user versions. **Systems start at $1195.**

Order our trial working demonstration version for a refundable deposit of just $25.

Call Today **1-800-858-3666** or **201-335-1256**
Dedicated Development Corp.
150 River Road, Suite N1, Montville, NJ 07045

Yours FREE - our complete catalog of sales and marketing software! Ask for a copy when you call!

CIRCLE 418 ON READER SERVICE CARD

THE DIFFERENCE IS IMAGE!

Premier wins proven results for advertisers whose messages stand out in affordable full color. Place your ad where image makes all the difference—with 875,769 Business Computing Experts who are spending over $100,000 a year on PC hardware, software, and services!

PC/COMPUTING PREMIER

800-825-4237

Video Training for Windows Applications

Your Personal Windows Training Specialists

Special Microsoft Office Video Training

Microsoft Office 4.0 Standard (1 videos/3 hours) ..$299.95
Microsoft Office 4.0 Pro (10 videos/24 hours) $495.95
Microsoft Office 4.0 Plus (15 videos/27 hours) $579.95

Special Lotus SmartSuite Video Training

Lotus SmartSuite 2 Standard (1 videos/3 hours)....$299.95
Lotus SmartSuite 2 Pro (10 videos/24 hours).....$495.95
Lotus SmartSuite 2 Plus (15 videos/27 hours) $579.95

Special Borland Office Video Training

Borland Office 2.0 Standard (5 videos/19 hours) $239.95
Borland Office 2.0 Pro (8 videos/37 hours) $349.95
Borland Office 2.0 Plus (11 videos/37 hours).....$429.95

Average: 1 hour & 45 minutes of instruction per video

MS Office Integration Video
$19.95 when purchased with any MS Office Combination (Reg. $40.95)

Dawn Bjork
Corporate Trainer
& MS Word Instructor

Word 6.0

Beg/Int/Adv	(exp)	$49.95
Desktop Publishing		$49.95
Mail Merge/Forms		$49.95
Any Three Videos		$129.95

WordPerfect 6.0

Beg/Int/Adv	(exp)	$49.95
Desktop Publishing		$49.95
Any Three Videos		$129.95
5.2 to 6.0 Upgrade		$49.95

PowerPoint 4.0

Beg/Int/Adv	(exp)	$49.95
Any Three Videos		$129.95

Many Other Titles Available
Call for Details

Dave Bellamy
MS Excel Specialist
& MS Excel/Project Instructor

Excel 5.0

Beginning		$49.95
Intermediate		$49.95
Advanced		$49.95
Any Three Videos		$129.95

Project 4.0

Level I/II/III/IV	(exp)	$79.95
All Four Videos		$299.95
Any Three Videos		$129.95

Lotus 1-2-3 Rel4

Beg/Int/Adv	(exp)	$49.95
All Three Videos		$129.95

Ami Pro 3.0

Beg/Int/Adv	(exp)	$49.95
All Three Videos		$129.95

Alison Balter
Corporate/Univ'l Trainer
& MS Access 2.0 Instructor

Access 2.0

Beg/Int/Adv	(exp)	$49.95
App. Dev. 1/2/3	(exp)	$49.95
Any Three Videos		$129.95
Any Four Videos		$159.95

Visual Basic 3.0

Unit 1/2/3	(exp)	$89.95
All Three Videos		$249.95

Paradox 4.5

Beg/Int/Adv	(exp)	$49.95
All Three Videos		$129.95

Quattro Pro 5.0

Beg/Int/Adv	(exp)	$49.95
All Three Videos		$129.95

Mark Wright
National Seminar Trainer
& MS Windows Instructor

Windows 3.1

Beginning	$49.95
Advanced	$49.95
Beg/Adv Set	$89.95
DOS & Win Basics	$49.95

CorelDRAW 4

Beg/Int/Adv	(exp)	$59.95
All Three Videos		$149.95

Publisher 2.0

Basics	$49.95
Power Features	$49.95

PageMaker 5.0

Beg/Int/Adv	(exp)	$49.95
All Three Videos		$129.95

KEYSTONE
Learning Systems Corp.

3 Easy Ways to Order:

C.O.D., Company P.O. or Checks

30 Day Money Back Guarantee

CALL ▶ 1-800-748-4838
801-375-8680

FAX ▶ 1-801-373-6872

MAIL ▶ K.L.S. Corporation
2181 Larsen Parkway
Provo, UT 84606

PCC 994

CIRCLE 419 ON READER SERVICE CARD

The Next Generation in Label Design Software

LabelWorks™ for Windows

LabelWorks sets the new performance standard for professional quality label design. No other program combines such easy operation with this much power!

- Provides Desktop Publishing features to enhance label design. Features include: WYSIWYG, rulers, guides, page zooms, lines, shapes.
- Rich text support allows you to edit font styles, types, and sizes within the same line.
- Supports all major Bar Code symbologies, including Code 39, 93, 128, POSTNET, UPC, Bookland EAN. 19 types in all.
- Imports & Exports using TIFF, GIF, BMP, PCX, WPG, WMF, TARGA graphic files.
- Rotates Text, Bar Codes and imported graphics in 90 degree increments.
- Prints labels on virtually any windows supported printer.
- Prints labels directly from dBase, DIF & ASCII files.

Dealer Inquiries Welcome.

Call for Free DEMO Software

AMERICAN MICROSYSTEMS
2190 Regal Parkway, Euless, TX 76040
(800) 648-4452 (817) 571-9015 FAX (817) 685-6232

FOR WINDOWS

myHouse

Create and walk through your home design projects in 3D color!

All New! Now with Movie Maker!

- *Easy 2D Floor Plan Creation*
- *Create And Edit A Home Movie Tour*
- *More Than 300 Predrawn 3D Design Objects*
- *Full-Size Plans–No Plotter Needed*
- *Compatible With myHouse For DOS*

ONLY $69.95

View your floor plans as fly-overs, 3D renderings or create a movie tour of your design.

DesignWare
17 Main Street, Watertown, MA 02172
PH: (617) 924-6715 Fax: (617) 924-1699

To Order, CALL:
800-536-2596

CIRCLE 421 ON READER SERVICE CARD

Multimedia Starts Here

NEW

From game development to broadcast quality animation. Strata's PC Power Tools have what you need. StudioPro PC offers sophisticated modeling tools, photorealistic rendering, and dazzling animation effects, making it the ideal choice for professionals. For others looking for an easy-to-use, full-featured graphics program, StrataVision 3d PC is your gateway to 3-D power. Both programs offer an intuitive graphical interface which gives artists the power to create, without worrying about the learning curve. Enter the world of Multimedia today by calling:

1-800-STRATA 3D

STRATA

CIRCLE 422 ON READER SERVICE CARD

"The hardest thing in this business is to find prospects..."

"but PC/Computing Marketplace is a great lead generator for us. The response was good with PC/Computing Classified, and it's even better with Premier. Four or five times better. PC/Computing Marketplace has substantially increased our sales. It's the keystone of our advertising campaign."

Raymond Melissa, President
Mailer's Software

Put your ad here and write your own PC/Computing success story ... start advertising now!

Call 800-825-4237 today.

Learn To Play The Piano, Create And Print Your Own Music, And Jam With Your Own Computerized Band!

CRESCENDO™

Music Upgrade Kit

Crescendo™ is the perfect music upgrade ... even if you already have a sound card or an upgrade kit.

Besides adding crystal clear Wavetable synthesis to your computer, Crescendo entertains, educates and opens the door to the wonderful world of music.

Crescendo includes ■ the Maui™ wavetable synthesizer card, with SampleStore™ technology, and 128 General MIDI instruments ■ a full-size, professional 49-key music keyboard ■ The Miracle Piano Teaching System™ software — hundreds of thousands of people have already been taught by this ingenious, interactive, serious musical educational system ■ Wave/SE™ sound editor, which lets you tailor .WAV files for use with SampleStore ■ Stratos™ MIDI sequencer software to record and play back your musical creation ■ and Band-In-A-Box™ musical accompaniment software with 24 different musical styles.

Visit your favorite dealer, or call **800-645-5640** for more information today!

TURTLE BEACH SYSTEMS

52 Grumbacher Road • York, Pennsylvania 17402 • 717-767-0200• FAX: 717-767-6033
All trademarks are registered by their respective companies Specifications may change without notice

CIRCLE 420 ON READER SERVICE CARD

The most powerful programmers editor for UNIX ...
...is now the most powerful editor available for DOS

PC-Emacs

- Customizable
- Extensible
- Unlimited file size & number of files
- Multiple file tags search/replace
- Mouse support
- Language modes: C, Fortran, Lisp,..
- Runs GNU Emacs lisp

Limited time introductory offer:
$129.95
Also available PC-Curses V.: $49.95

- Editor Emulations: vi, EDT, Gosling...
- Multiple windows
- Unlimited key bindings
- Cut & paste between files/windows, without size limitations!
- Subprocess support
- Suspend to DOS

Use the same editor for DOS, Unix,or VMS...
The most complete GNU Emacs implementation available on the PC...
...out-performe other editors costing three to five times ee much !!

If You're a Serious Programmer...
800-3-ASRINC *"...Emacs is Life"*
Advanced Software Research, Inc. *"Bringing Power to the PC"*™
Member of the Better Business Bureau
3102 Business Center Dr. Irvine, CA (714) 253-4110

CIRCLE 424 ON READER SERVICE CARD

We Want to Send You a

FREE!

268 PAGE CATALOG OF COMPUTER SUPPLIES & ACCESSORIES

Plus!

We will add you to our mailing list for one year on a trial basis – in which time you will receive 4 catalogs from the most unique company in our industry.

WHAT MAKES US DIFFERENT!

A complete selection of computer supplies, hardware, networking products and software for every computer need, whether business or individual. Plus, we do it without marketing glitz or hype – instead we operate in a down-to-earth straightforward and honest manner. And lastly – we've been in business over 12 years and have grown every year by putting our customers and employees first!

LYREN
COMPUTER SYSTEMS

5545 Bridgewood, Sterling Heights, MI 48310
PH: (810) 268-8100 FAX: (810) 268-8899
Simply utilize the reader service number below – or call, write or fax us for your free catalog.

CIRCLE 426 ON READER SERVICE CARD

LEARN A FOREIGN LANGUAGE!

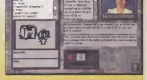
In today's international marketplace, knowing a second language is more important than ever. With foreign language courses from HyperGlot, you can gain that competitive edge. We have courses in Spanish, French, German and Italian.

LEARN TO SPEAK SPANISH 4.0 WITH VIDEO!

A complete first year language course with extensive Quicktime™ video and sound on CD. This course will teach you to speak, understand, read and write Spanish! Native speakers lead you through the course step by step. **Spanish 4.0 and many other HyperGlot Products are available through your local retailer.**

1-800-290-4568

To order or receive a catalog call toll-free or write: P.O. Box 10746, Knoxville, TN. 37939



HyperGlot the foreign language software company.

CIRCLE 425 ON READER SERVICE CARD

"Since we've been advertising in PC/Computing Premier, we've seen very impressive growth..."

"We use PC/Computing Premier to gain market recognition and to put us in front of the right buyers. We're building our direct sales and a valuable customer base with Premier."

Scott Childress, Chief Operations Officer
Hyperglot Software Company Inc.
foreign language software

Put your ad here and write your own PC/Computing success story... Start advertising now!

CALL 800-825-4237 TODAY.

"With PC/Computing Premier, for every ad dollar I spend, I make three times the amount!"

"Business people read PC/Computing. They're looking for products to make their businesses run more effectively and efficiently. We're reaching these buyers and we're consistently making money with Premier. That makes it a winner."

Don DeLucco, Dir. of Marketing & Advertising
Talking Technology, Inc.
voice cards manufacturer

Put your ad here and write your own PC/Computing success story... Start advertising now!

CALL 800-825-4237 TODAY.

Save Disk Space

PKZIP®

"PKZIP is the undisputed champion of data compression" - BYTE Magazine

"It [PKZIP] combines blazing decompression times and excellent compression speed" - PC Magazine

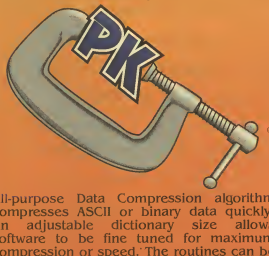
PKZIP version 2.0

PKWARE® introduces the next generation of its award winning compression utility. PKZIP 2.0 yields greater performance levels than achieved with previous releases of the software.

Software developers! You can significantly reduce product duplication costs by decreasing the number of disks required to distribute your applications. Call for Distribution License information.

Data Compression Library

The PKWARE Data Compression Library® allows you to incorporate data compression technology into your software applications. The application program controls all the input and output of data, allowing data to be compressed or extracted to or from any device or area of memory.



All-purpose Data Compression algorithm compresses ASCII or binary data quickly. An adjustable dictionary size allows software to be fine tuned for maximum compression or speed. The routines can be used with most popular languages, such as C, C++, Pascal, Assembly, Basic, etc.

PKLITE® Put Your Executables on a Painless Diet!

PKLITE increases your valuable disk space by compressing executable (.EXE and .COM) files by an average of 45%. The operation of PKLITE is transparent. All you will notice is more available disk space!

Software developers! Save disk space and media costs with smaller executables. You can distribute your software in a compressed form with PKLITE Professional.® PKLITE Professional gives you the ability to compress files so that they cannot be expanded. This discourages reverse engineering of your programs.

You may place your order for PKWARE products by phone, by fax or by mail. Prices listed are for use on a single computer. Please call for multiple use information.

PKZIP, PKUNZIP,® PKSFX® 2.0	$47.00
PKLITE	46.00
PKLITE Professional	146.00
PKWARE Data Compression Library	295.00

Please add $5.00 Shipping & Handling per package in the US & Canada, $11.25 overseas. Wisconsin residents please add 5% state sales tax and applicable county sales tax.

Terms: ALL ORDERS OUTSIDE OF THE UNITED STATES AND CANADA MUST BE PREPAID. MasterCard, VISA, Check or Money order drawn on an USA bank in US FUNDS, NO COD. Corporate Purchase Orders (Net 30 Days) accepted for software from large corporations within the USA & Canada. Please make remittance payable to PKWARE Inc. Prices and Terms subject to change without notice.

You can receive a catalog containing information on the complete line of PKWARE software by calling or writing.

PKWARE INC.

9025 N. Deerwood Drive Brown Deer, WI 53223-2437
(414) 354-8699 Fax (414) 354-8559

PC/C 9/94

CIRCLE 427 ON READER SERVICE CARD

PhoneDisc

the fastest way to find anyone, anywhere!

Leading PC magazines agree — PhoneDisc® offers superior nationwide directory assistance on CD ROM. Named one of *PC Computing*'s top two business CDs, and *PC World's* top 25 CDs, PhoneDisc offers four product options to help you find anyone, anywhere.

PhoneDisc Business $79 has 9.5 million listings. Reverse search indexing, finds business by address, phone number or business category (2,000 SIC codes).

PhoneDisc Residential $79 offers 81 million residential directory listings nationwide searchable by name. Stored on just two discs, limit name searches by address.

ComboPack $129 PhoneDisc Business and Residential. Two great products, one great price!

PowerFinder $249 Power-packed CD-ROM directory contained on five regional discs. 91 million Residential and Business listings with full reverse search indexes to create the most comprehensive and useful research tool of its kind.

TO ORDER CALL NOW!

1-800-284-8353

Digital Directory Assistance, Inc • 6931 Arlington Rd., Suite 405 • Bethesda, MD 20814

CIRCLE 428 ON READER SERVICE CARD

Protects While You Type!

(Down) Time is Money

- Remains in place during use...just type right through it
- Prevents costly repairs
- Soft, flexible, fits like a glove
- Durable High-Tech Polymer lasts for years
- More than 1,000 custom fit models available
- **The original SafeSkin® - Only $24.95**

▶ Protect Your Entire System

Dust Covers - All Models - All Styles
Economical Vinyl from $6.95 each
Breathable Fabric from $7.95 each

▶ Call Today: 1-800-627-7752

VISA/MC or COD
MCP, Inc. FAX (214) 339-1313 Dealer Inquiries Invited.

CIRCLE 430 ON READER SERVICE CARD

COMPUTER CHECKS

CONTINUOUS AND LASER

AS LOW AS $24.95

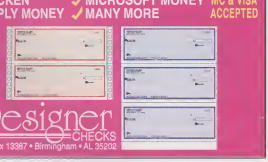
CALL: 1-800-239-4087

FAX ORDERS: 1-800-774-1118

(PLEASE FAX COPY OF VOIDED CHECK)

✓QUICKEN ✓MICROSOFT MONEY
✓SIMPLY MONEY ✓MANY MORE

MC & VISA ACCEPTED



Designer CHECKS
P.O. Box 13387 • Birmingham • AL 35202

CIRCLE 429 ON READER SERVICE CARD

THE VISIBLE DIFFERENCE!

Your four-color Premier ad gets out more than the word to 875,769 Business Computing Experts who are spending over $100,000 a year on PC hardware, software, and services.

It shows them—with full-color depth and dimension—your commitment to long-term business...your confidence in your products. Seeing is believing! Call today for details on what a difference you can make with an affordable display in Premier!

PC/COMPUTING PREMIER

800-825-4237

Source TECHNOLOGIES INC

YOUR ONE STOP PC UPGRADE SOURCE

The only thing better than our prices... is our quality, customer service.

COMPATIBILITY 100% GUARANTEE

486DX MOTHERBOARDS

486 VESA LOCAL BUS
3 VL Slots/6 16 bit.
Up to 128MB 30 or 72 Pin Simms
256K Cache Exp to 512 K
Green Support, AMI Bios/SIS Chips
Uses 486SX/DX2-4 P24T
$139

486 PCI LOCAL BUS
4 PCI Slots/4 16 bit ISA
Up to 128MB Using 72 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Intel Chipset, Green Supp
Uses 486SX/DX2-4 P24T
$199

486 EISA/VESA BUS
2 VLB Slots/8 EISA Slots
Up to 128MB Using 30 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Sis Chipset, Green Supp.
Uses 486SX/DX2-4 P24T
$288

PENTIUM MOTHERBOARDS

PENTIUM 586 PCI or EISA BUS
2 PCI Slots/5 EISA Slots or
4 PCI Slots/4 ISA Slots
Up to 128MB Using 72 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Intel Chipset, Green Supp.
Baby AT Size, 60 or 66 MHz
60/65/90/100 MHz
$389

PENTIUM 586 VLB/ISA BUS
3 VLB Slots/5 ISA Slots
Up to 128MB Using 72 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Intel Chipset, Green Supp.
Baby AT Size, 60 or 66 MHz
60/66/90/100 MHz
$349

CYRIX MOTHERBOARDS

CYRIX 486DLC VLB/ISA BUS
2 VLB Slots/5 ISA Slots OR
8 16 BIT ISA Slots
Up to 32MB Using 30 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Opti Chipset
2/3 Baby AT Size
486DLC 33/40 VLB **$184/224**
486DLC 33/40 ISA 6 Slot **$164/174**

IBM 486 MOTHERBOARDS

IBM 486SLC 2-66 Leopard
3 VL Slots/5 16 Bit
Up to 32MB Using 30 Pin Simms
AMI Bios/Opti Chipset
VLB Version 64 K Cache to 128 K
486SLC 2-66VLB/ISA
$285/215

BLUE LIGHTING 486SLC2/75 VLB
3 VL Slots/5 16 Bit
Up to 64MB Using 72 Pin Simms
256K Cache Exp to 512 K
AMI Bios/Opti Chipset
2 ser/parport & VL IDE Controller
2/ Socket for DX2 or P24T
486 SLC 2-75/100
$389

MULTIMEDIA UPGRADES

MULTIMEDIA KIT: Grayis Ultrasound, CR328 CD-ROM 2x Spin, 300ms Photo/Full Motion Video Capable, Bundled Software, 3 Titles, Powered Stereo Speakers. **$299**
10 Title CD Bundle: Kings Quest 5, Stellar 7, DOOM, World Atlas, CD-ROM of CD ROMS, World Fact Book, Animation Fest & More **$39**
SOFTWARE VAULT COLLECTION: Includes 1,000's of shareware programs, 100's of HOT games, windows utilities. **$24.75**

CPU's

INTEL	
Pentium 60-100	**CALL**
486 DX4-100	$565
486 DX2-66	$319
486 DX2-50	**CALL**
486 DX-33	$189
486 SX-25/33	$65/$99
AMD	
486 DX2-66	$285
486 DX-40	$199
486 DX2-50	$210
486 DX-33	$180
CYRIX	
486 DX-33	$175
486 DLC-33/40	$75/85
CYRIX MATH-CO's	
80387SX-20/25/33	$35
80387DX-20/25/33	$35

CPU UPGRADES

INTEL OVERDRIVE
486 DX-SX-25/33 **$CALL**
CYRIX
486 DRx2 16/32 $245
486 DRx2 20/40 $299
486 DRx2 25/50 $349
486 SRx2 20/40 $299
DLC Kits, Inc. Math-Co & Software
486DLC-40 $139
486DLC-33 $120

MEMORY

30 PIN SIMMS	
1x3-60/70/80	$45/40/38
1x9-60/70/80	$60/50/45
4x9-60/70/80	$160/150/145
72 PIN SIMMS	
1x36-60/70/80	$165/155/150
2x36-60/70/80	$379/335/325
4x36-60/70/80	$647/628
8x36-70/80	$1199/1267
DRAM	
256x4-70/80	$5.50/6.00
256x1-80	$2
1x1-70/80	$5.50/6.00
1x4 & 4x1	Call
VRAM	
256x4-70(28 pin)	$11
CACHE	
32x8-15/20/25	$7.50/8/8.50
128x8-15/20/25	$30/25/20

VIDEOBOARDS

Cirus VLB 1mb/2mb	$79/129
Trident SVGA 256k/1mb	$39/69
ATI	
Graphics Pro Turbo ISA/VL/PCI 2mb/4mb	Call
Graphics Ultra Pro 2mb	$329
Graphics Ultra- 2mb	$229
DIAMOND	
Viper VLB 2mb	$375
Speedster 64 PC 1mb	$155/119
Stealth 64 PC 1mb	**$CALL**
HERCULES	
Dynamite 2mb	$205
Graphite 2mb	$369
ORCHID	
Kelvin	Call

HARDDRIVES

WESTERN DIGITAL	
Cav1210 210mb 12ms	$220
Cav2250 250mb 12ms	$219
Cav2540 340mb 12ms	$249
Cav4220 425mb 12ms	$259
Cav2540 540mb 12ms	$369
MAXTOR	
7245A&S 245mb IDE/SCSI	$227
7345A&S 345mb IDE/SCSI	$255
540SL 540mb SCSI	$429/$65
CONNER	
CP30174 170mb IDE	$179
CP30254 250mb IDE	$225
CP30344 340mb IDE	$260
CP30420 420mb IDE	$269
CP30540 540mb IDE	$379
MICROPOLIS	
2210 976mb IDE/SCSI	**$CALL**
2212 1gb IDE/SCSI	**$CALL**
2217 1.2gb IDE/SCSI	**$CALL**

CONTROLLERS

VLB IDE-IO	$26
ISA IDE-IO	$13
VLB-IDE CACHE	$125
VLB SCSI	$125
PCI-IDE-IO	$59
PCI-IDE	$45
PCI-IDE CACHE	$135
PCI-SCSI	$135
Adaptec SCSI	**$CALL**

HOT DEALS!!!

SIMMS

1x9-70 (3 chip)	$40
1x36-70	$149

486DX VLB MOTHERBOARD
(3 VL Slots - 256K Cache)

w/DX4-100+Fan	$799
w/DX2-66 +Fan	$395
w/SX25	$185

CALCOM

14.4 Fax/Modem	$75
28.8 Fax/Modem	$169

Both include Delrina Windows software + online start-up kits

540 MB IDE Hard Drive $299

TEAC 4X SPIN CD-ROM, 195MS
LIMITED QUANTITIES **$389**

We will buy your old memory or CPU's. Cash paid or Credit toward future purchase.

Save hundreds by upgrading you 386, 486 or even 286 with a new motherboard or CPU. Our knowledgable sales staff will be glad to discuss the money-saving options available

- 30 Day Money Back Guarantee
- %100 Compatibility Guarantee
- Thousands of Products Not Listed
- Free Technical Support
- No Surcharge on Visa, MC AMEX & Discover
- Fastback Technical Specs
- Govt & Educational Pricing
- Corporate & Govt PO's
- 2 Year Warranty on All Products
- Overnight Delivery to Most Areas, Up to 3 lbs $8
- Same Day Shipping
- Knowledgeable Sales Staff

TERMS AND CONDITIONS
Return Merchandise Authorization (RMA) required for all returns. 20% restock on non-defective returns. Price and availability subject to change without notice. Source Technologies not responsible for typographical errors.

MC VISA DISCOVER AMERICAN EXPRESS

Source TECHNOLOGIES INC
1908B Pomona Ave.
Costa Mesa, CA. 92627

Customer Service/ (714) 631-7996
International
Fax Orders (714) 631-9087

Memory & Chip Prices Change Daily - Call For Best Prices

CALL THE UPGRADE SPECIALISTS TODAY!

800-429-7800

CIRCLE 501 ON READER SERVICE CARD

The Low Price Leader

486SX-33 $1149

Pentium OverDrive Ready
4MB RAM, 256K Cache
3.5" Floppy Drive
14" SVGA .28 NI Monitor
MS-DOS 6.2 & WFW 3.11
Intel 486SX-33 Processor
210MB IDE Hard Drive
1MB VESA LB Video
High-Resolution Mouse

486DX-33 $1329 **486DX2-50 $1349**

DX4-100 $2399

Pentium OverDrive Ready
8MB RAM, 256K Cache
3.5" Floppy Drive
1MB VESA LB Video
High-Resolution Mouse
Intel 486DX4-100 Processor
540MB IDE Hard Drive
Double Speed CD-ROM
15" SVGA .28 NI Monitor
MS-DOS 6.2 & WFW 3.11

486DX2-66 $2109 **DX4-75 $2299**

CD-ROM DRIVES

MITSUMI FX-001D Double w/Interface	$155 00
Panasonic 562 Double	$152 00
NEC Multispin 3XI Internal	$424 00
NEC Multispin 3XE External	$459 00
NEC Multispin 4X Pro Pro Ext CD Quad	$959.00
NEC Multispin 3XP Portable	$379 00
NEC 3XSPEED SCSI 510	$369 00
Toshiba 3401B Int Double SCSI-2	$319 00
Toshiba 3401E Ext w/Adapter Kit	$569 00
Plextor Int SCSI-2 240MS 335KB/S MPC-2	$269 00

FLOPPY DRIVES

TEAC 55GRF 1 2MB 5 25 FDD (Beige/White)	$54 00
TEAC 235HF 1.44MB 3 5 FDD (Beige/White)	$45.00
TEAC 235J-653 2 88MB 3 5 FDD	$98.00
TEAC 505 Two in one 5.25 FDD	$107.00
Mitsumi 1 2MB 5 25 FDD (Beige/White)	$52 00
Mitsumi 1.4MB 3.5 FDD (Beige/White)	$39 00

FAX/MODEM

Harmony 14,400 bps Int w/software for Window	$93 00
Harmony 14,400 bps Ext. w/software for Window	$113.00

HUB

D-Link 12-Port 10 Base T Ethernet	$386 00

KEYBOARDS

Mitsumi KPO-E99YC 101 Key Standard Size	$ 27.00
Mitsumi KKR-E99AC 101 Key Saver Size	$ 16.00
Oki Click 101 Keys (Japan)	$ 25.00
Focus 9000 129 Key Programmable w/c	$ 55.00

LAN CARDS

16 Bit ISA Bus Ethernet C	$ 40.00

MEMORY

1MB X 3 Simm 30 Pin	$ 43.00
4MB X 9 Simm 30 Pin	$155.00
4MB Simm 72 Pin	$181.00
COMPAQ	
4MB for Concerto 425	$259 00
8mb for Concerto 425	$499 00
4MB Contura 4/20/25/25C/25CX	$189.00
8MB Contura 4/20/25/25C/25CX	$365.00
16MB Contura 4/20/25/25C/25CX	$776 00
4MB Contura Aero	$245.00
8MB Contura Aero	$425.00
4MB Lte Lite 4/25C/25E/25	$215.00
8MB Lte Lite 4/25C/25E/25	$375.00
16MB Lte Lite 4/25C/25E/25	$805.00
IBM	
4MB CL57SX Thinkpad 700/C 720/C 750/C	$209 00
8MB CL57SX Thinkpad 700/C 720/C 750/C	$389 00
16MB Thinkpad 750/C	$799 00
TOSHIBA	
4MB T4500/4600/4700 T1900/T1910/T1950 3.3V	$219 00
8MB T4500/4600/4700 T1900/1950 3.3V	$469 00
16MB T4500/4600/4700 t1900/1910/1950 3.3V	$959 00
4MB T3400/C 3 3V	$225.00
8MB T3400/C 3 3V	$445 00
HP LASER PRINTER/FAX MEMORY	
Laser Jet II/II D 2MB/4MB	$110/195 00
Laser Jet IIP/III/IIID/IIIP/II Plus 2MB/4MB	$95/177 00
Desk Jet 500/500C/Plus/520/550C/560C 256KB	$40.00
Laser Jet 4L 1MB	$49 00
Laser Jet 4P, 4Plus 2MB/4MB/8MB	$92/160/297.00
Laser Jet 4, 4M, 4Si, Dest Jet 1200C/PS 2/4/8 MB	$95/162/299.00
Laser Jet Fax 1MB	$55.00
HP 300/310 Fax 2MB	$230 00

SOUND CARDS

CREATIVE LAB	
Creative Lab SB 16 Value Edition	$99.00
Creative Lab SB 16 MCD	$149.00
Creative Lab SB 16 MCD ASP	$199 00
Creative Lab SB 16 SCSI-2	$169.00
MEDIA VISION	
Media Vision Pro Audio Spectrum 16 SCSI	$99.00
Media Vision Pro Audio Studio 18 SCSI	$129.00
MEDIA MAGIC	
16 Sound Card	$79.00

MONITORS

ADI	
ADI Microscan 3G 14" Dig 1280x1024	$335 00
ADI Microscan 3GP 14 28 Dig. Epa Mprll 1280	$365 00
ADI Microscan 4G 15" 28 Dig 1280x1024	$425 00
ADI Microscan 4GP 15" 28 Dig EPA MPR II	$455 00
ADI Microscan 5AP 17" .26 Dig. EPA MPR II	$819.00
ADI Microscan 5EP 17" .28 Dig. EPA MPR II	$765.00
MGC	
MGC 2039 14" .39 1024x768 Ni Green	$207 00
MGC 2402 14" 28 1024x768 Ni Green	$249 00
MGC 1506D 15" 28 Flat Vesa 1280x1024 Ni Green	$349 00
MGC 1506E 15" .39 Flat Vesa 1280x1024 Ni Green	$339 00
MGC 1588VA 15" 28 Vesa Ni Lr 1280x1024	$359.00
NEC	
NEC 14" SVGA 1024x768 Ni .28 Analog	$309.00
NEC 3FGE 15" 1024x768 Ni 28	$559 00
NEC 3V 15" 1024x768 Ni 28	$469.00
NEC 4FGE 15" 1024x768 NI 28 Digital Cont	$819 00
NEC 5FGE 17" 1024x768 NI 28	$999 00
NEC 5FGP 17" 1280x1024 NI .28	$1,099 00
NEC 6FGP 21" 1280x1024 NI .28	$1,999 00

HARD DISK DRIVES

CONNER	
Conner CF-210A 210MB HDD	$202.00
Conner CFA-420A 420MB HDD	$275 00
Conner CFA-540 540MB HDD	$382 00
MAXTOR	
Maxtor 170MB 15MS IDE 3 5 HDD	$216 00
Maxtor 245MB 15MS SCSI 3 5 HDD	$249 00
Maxtor 345MB 15MS IDE 3 5 HDD	$259.00
Maxtor 345MB 15MS SCSI 3 5 HDD	$320 00
Maxtor 548MB 9MS IDE 3 5 HDD	$379 00
IBM	
IBM 365MB IDE 12MS 3 5 HDD	$275 00
IBM 548MB IDE 12MS 3 5 HDD	$385 00
IBM 730MB IDE 12MS 3.5 HDD	$546 00
QUANTUM	
Quantum LPS-540 540MN 12MS IDE HDD	$379 00
MICROPLIS	
Microp 1050MB 10MS SCSI-2 HH 5400RPM	$779 00
Micro 2 1GB 13MS SCSI-2 5 25 FH Buffer	$1,399 00
Micro 3GB 12MS SCSI-2 5.25 FH	$2,149.00
WESTERN DIGITAL	
WD 212MB 13MS (Caviar) IDE 3.5 1"	$209 00
WD 340MB 13MS (Caviar) IDE 3.5 1"	$259 00
WD 420MB 13MS IDE 1"	$329 00
WD 540MB 10MS IDE 3.5 1"	$389 00

Multimedia Kit

16-bit sound card, speakers $99.00
***Select any 1 of the following bundle titles for only $69.00**
with the purchase of any Systems, Sound Card or CD-ROM drive listed in our ad

CD COMBO/TITLES

ACTION PACK 1 $69.00
Grolier Encyclopedia, The Animals by San Diego Zoo
Action Series
1. RoboCop 3, 2. Push Over, 3. F-29 Retaliator
4 EPIC, 5. Paperboy 2, 6 Might & Magic II
7. D/Generation, 8 Contraption Zark
9. Chessmaster 2100

ACTION PACK 2 $69 00
Compton's Interactive Encyclopedia 1994, CD Delux 4
Mavis Beacon Teachers Typing V.2 0,
Chessmaster 4000, U.S Atlas V.4 0, World Atlas V.4.0
Action Series
1 RoboCop 3, 2 Push Over, 3 F-29 Retaliator
4. EPIC, 5 Paperboy 2, 6. Might & Magic II
7. D/Generation, 8 Contraption Zark
9. Chessmaster 2100

ENTERTAINMENT PACK I $69 00
Grolier Encyclopedie, The Animals by San Diego Zoo
CD Delux 4, Mavis Beacon Teaches Typing V.2.0
Chessmaster 4000, U S. Atlas V 4 0, World Atlas V.4 0

EDUTAINMENT PACK $69 00
San Diego Zoo Presents - Animals
Software Tool Works CD Game Pack II incld.
Life & Death, Robert Tank, Chessmaster 2100
Checkers, Gin King-Cribbage King, Loopz
Beyond the Black Hole, Puzzle Gallery
Backgammon, Disan Lau Mission: Hong Kong
1994 New Multimedia Grolier Encyclopedia V.6.0

PREMIUM PACK $69.00
San Diego Zoo present-Animals, Ocean Below
Space Shuttle, 20th Century Video Almanac
Capital Hill
Birds and How They Grow (by National Geograph)

NEW WAVE PACK $69.00
Dinosaurs, Whales, Spiders, Cinderella/Thomas Snowsuit,
Challenge Pack, includes
RoboCop 3D, Contraption D. Generetion
Push Over, Might & Magic II F-29 Retaliator
Life & Death II Epic Chessmaster 2100

LEGEND PACK $69 00
The Tale of the Benjamin Bunny
Scary Poems of Rotten Kids
Twin Value 1 includes
The Paper Bag Princes Mud Puddle.
Twin Value 1 includes:
Cinderella Thomas Snowsuit.
Challenge Packs includes.
Life & Death II, Might & Magic II, Push Over,
Epic Contraption. D Generation
F-29 Retaliator, Chessmaster 2100, RoboCop 3D

DISCOVERY PACK $69.00
Whales, Farm Animals, Spiders, Butterflies, Dinosaurs
CD Deluxe includes:
US World Atlas, World Atlas, Mavis Beacon
Teaches Typing, Chessmaster 3000

MEDIA WONDER PACK $69.00
Farm Animels, Butterflies, Twin Value I includes:
The Paper Bag Pnnces, Mud Puddle,
CD Deluxe includes:
US World Atlas, Mavis Beacon Teaches Typing,
World Atlas, ChessMaster 3000,
CD Games pack II includes
Life & Death, Robot Tank, Chessmaster 2100

PCMCIA

EXPThinFax 9624 PCMCIA 2 0 for ell Notebook	$110.00
EXPThinFax 1414 PCMCIA Type II for all Notebook	$178 00
EXPThinFax Basic 9600send/2400receiveFax 2400 modem	$95 00

TAPE BACKUP

Colorado DJ-10 120MB Jumbo Internal	$99 00
Colorado DJ-20 250MB Jumbo Internal	$170.00
Colorado JT-10 120MB Jumbo External	$210 00
Colorado JT-20 250MB Jumbo External	$319 00
Colorado Power Tape 1-2 GIG SCSI TBU	$939.00
Colorado PT25 Ext. Unit/Controller	$1,079.00
Colorado Power TAAPE2-4 GIG SCSI TBV	$1,129 00
Colorado PTE50 External	$1,359 00
Colorado Int Powerdat Tape Backup	$1,129 00
Colorado PD60 Externel	$1,359 00

VISA MasterCard American Express Discover

NO SURCHARGE
We accept Fortune 500 & Government bids & PO's.
We check for COD and Credit Card fraud!
Prices & specifications subject to change without notice Shipping charges are non refundable Returns must be in new condition and in original packaging Defaced items may not be returnable No refunds on software or special orders (items not listed in ad) All refunds subject to 15% restocking fee All trademarks are registered trademarks of their respective companies Personal checks held for clearance We reserve the right to refuse any sale for any reason ©1994

Standard Systems Supply, Inc.

15375 Barranca Parkway C-109, Irvine, CA 92718
Tel: 714-753-1265 • Fax: 714-753-4735

CALL NOW TOLL FREE 800-838-8558

MEMORY

GUARANTEED LOWEST PRICES
Upgrades for Desktops, Laptops, Laser Printers from Apple to Zenith

PCMCIA SYSTEM SOLUTIONS
1.2 MB SRAM 2.4,8 MB Flash Memory
96/24 Fax Modem 14.4/14.4 Fax Modem

BEST PRICES ON SIMMS & DRAM

30 PIN SIMMS	72 PIN SIMMS
1 x 3	1 x 36
1 x 9	2 x 36
4 x 9	4 x 36
16 x 9	8 x 36

WE BUY EXCESS MEMORY
We accept P.O.'s from government, schools & qualified firms
1-800-808-6242
ERITECH INTERNATIONAL
818/244-6242 fax 818/502-5059

CIRCLE 503 ON READER SERVICE CARD

THE FINEST MOTHERBOARDS!

HSB Computer Wholesale, one of the industries most respected circuit board manufacturers, is now offering TRUE factory-direct wholesale pricing direct to the public. Just a few examples include:

- HSB 80486/P24T VESA MB with 256KCC & Intel 80486DX2-66 CPU — $432
- HSB Cirrus logic GD-5428 VESA Video Card with 1 Meg 67Mz WinMarks — $94
- HSB Promcor Caching VESA Multi I/O IDE Controller with 1Meg . . . — $138

Please call for a free wholesale price guide/info packet. All HSB MainBoards and video cards include a 60-DAY money-back guarantee, and a 3-YEAR warranty. When you REALLY want the best, choose HSB. Major credit cards & CODs accepted.

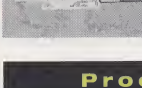
HSB MANUFACTURING/DISTRIBUTING COMPANY
31208 Aurora Road #217, Cleveland OH 44139
TEL: 1-800-487-8481 FAX: 216-486-1374

CIRCLE 504 ON READER SERVICE CARD

Best Price & Quality (800)888-3318

TOP DATA

SYSTEM	M/B +CPU	BASIC SYS M/B +CPU, 1MB MEM SUPER IDE, 1.4A FD MINI TOWER W/230W 101 KEYBOARD	BASIC SYS 4MB MEM 120MB HDD 14" SVGA	BASIC SYS 4MB MEM 200MB HDD 14" VGA	BASIC SYS 8MB MEM 340MB HDD 14" SVGA
Pentium 90C PCI/IDE CTR	1,129	1,289	1,849	1,909	2,129
Pentium-66C PCI/SCSI CTR	999	1,159	1,719	1,779	1,999
Pentium 66C VLB	869	1,029	1,589	1,649	1,869
486DX4-100C PCI/SCSI CTR	749	909	1,469	1,529	1,749
486DX4-100C VLB	639	749	1,309	1,369	1,589
486DX2-66C VLB/DX4 Upgrade	299	459	1,019	1,079	1,299
486DX33C VLB	199	359	919	979	1,199
486DLC40C VLB/DX40/Upg	179	339	899	959	1,179
486SLC66C VLB/P83D33/Upg	259	419	979	1,039	1,259
6DX2-66C EISA VLB	479	639	1,199	1,259	1,479
486DX2-66C ISA	289	449	1,059	1,119	1,339
486DX50C ISA	279	439	999	1,059	1,279
486DX40C ISA	199	359	919	979	1,199
486SX33 ISA	119	279	839	899	1,119
486SLC33 ISA	79	239	799	859	1,079
386DX33/64C ISA	79	239	799	859	1,079
386SX40 ISA	59	219	779	839	1,059



TOP DATA
1-800-888-3318
Infor./Int'l: (408)734-9100
Service/Tech Support: (408)734-9343
Fax Order: (408)734-9340
574 Weddell Drive #5
Sunnyvale, CA 94089
Hours: M-F 8AM-9PM
Sat 10AM-4PM (PST)

TERMS & CONDITION
1. One year parts and labor warranty.
2. 30 days money back guarantee.
3. All products are non-returnable after 30 days.
4. S & H charges are extra & nonrefundable.
5. Price & availability subject to change w/o notice.
6. Not responsible for typo.
7. Purchase orders are welcome & subject to approval.

CIRCLE 505 ON READER SERVICE CARD

91% of PC/Computing subscribers who know Marketplace have purchased software in the past 12 months, or would consider doing so, after seeing an ad in the section..

Get your share!

800-825-4237

Source: '93 PCC Marketplace Subscriber Study Base: The 66% of subscribers who have noticed Marketplace

Processor Upgrades

Now H.Co. Computer Products, Inc. Has Added Processor Upgrades To It's Vast Assortment Of Memory Upgrade Products!

Try One Of H.Co's *GO-486!* Clock Doublers or Triplers, and Improve Performance By Up To 500%. Try Our *GO-486!* For Most 286, 386SX, and 386DX Systems, Or Our *GO-DX4* For 486 Computers. Our Upgrades Work In Proprietary Systems And Clones So They Will Help Protect Your Current System Investment.

286 (6-16MHZ) TO IBM SLC2-50 MHZ.....$269.00
386SX-16 & 20 TO TI SXLC2 20/40 MHZ.....249.00
386DX-16 & 20 TO TI SXL2-20/40 MHZ 279.00
386DX-25 TO TI SXL2-25/50 MHZ.....329.00
386SX-25 TO IBM SLC2 25/50 MHZ 329.00
386SX-33 TO IBM SLC2 33/66 MHZ 379.00
386DX-33 TO IBM B. LTNG 33/66 MHZ 499.00
386SX-16 TO IBM B. LTNG 16/48 MHZ $399.00
386SX-20 TO IBM B. LTNG 20/60 MHZ 399.00
386DX-16&20 TO IBM B. LTNG 20/60 MHZ....399.00
386DX-25 TO IBM B. LTNG 25/75 MHZ 499.00
386DX-33 TO IBM B. LTNG 33/99 MHZ 699.00
486DX 33 OR OX2/66 TO GO-OX4-100 MHZ ..839.00
*(CONVERTS 5V SOCKET TO 3V SOCKET)

CALL H.CO. COMPUTER PRODUCTS FOR ALL OF YOUR MEMORY & PROCESSOR UPGRADE NEEDS!

1-800-RAM-CHPS OR 1-800-726-2477

CIRCLE 574 ON READER SERVICE CARD

BAR CODE READERS

AMERICAN MICROSYSTEMS
2190 Regal Pkwy. • Euless, Texas 76040 • (817) 574-9015

FOR PC, XT, AT, PS/2 & TERMINALS:

- No software changes required
- Data appears as keyboard input
- Reads Code 39, I-2of5, UPC/EAN, Codabar 11, 93, 128, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, MAG STRIPE, CCD, LASER
- Easy To Use

MAG STRIPE

SLOT (BADGE)

WAND

LASER

CCD

METRO LASER

BAR CODE PRINTING SOFTWARE:

- For Epson, OKI, IBM, Dot Matrix and HP LaserJet Printers
- Prints Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey

DECODER BOX

PORTABLE READERS:

- Use as a portable, wedge or terminal
- Input Devices: WAND, CCD, or SV LASER
- Real-time clock for date and time stamps
- Automatic power off with resume
- "Built-In" Inventory programs
- 54 key alpha/numeric keyboard
- Supports HAYES compatible modems

VISA MasterCard

(800) 648-4452 • FAX: (817) 685-6232
30 Day Money Back Guarantee
One Year Warranty

TPS Electronics

BAR CODE SCANNERS AND SOFTWARE FOR ALL PCs, PS/2s & MACS

- Connect to keyboard port of computer
- Input bar code data into any program
- Integrated Laser "Wedge"
- Dos, Unix, Mac compatible
- Laser, CCD, Wand, "In-Counter" or slot input
- Magnetic stripe (credit card) readers
- Portable systems
- MC/VISA/AMEX/P.D./C.O.D.
- 30-Day money-back guarantee
- Direct from manufacturer
- Inventor of Keyboard Wedge for PC/XT/AT & PS/2

TPS Electronics
800-526-5920

2495 Old Middlefield Way
Mountain View, Ca. 94043
415-988-0141 / Fax:415-988-0289
AppleLink: BARCODE

CIRCLE 507 ON READER SERVICE CARD

PAYROLL
WINDOWS or DOS

to license or private label.

Let us do the tedious work of maintaining the tax structures. Easy to use and it performs the essentials.

CALL 800-SVS PAYS
787-7297

SUN VALLEY SPECIALTIES
Box 6637 Boise, ID 83707

CIRCLE 508 ON READER SERVICE CARD

Barcoding with Windows!

The bar coding software that's easy to install *and* easy to learn!

WindowBar™

Ideal for compliance labeling!

- Full-featured, network-read, fully DDE compatible!
- Variable graphics (WYSIWYG)
- Interactive & automatic printing tools via Windows!
- **Rated as the "TOP RECOMMENDATION" by independent expert when tested vs 11 other packages!**
- Supports all popular symbologes, most bar code printers and databases
- Full design capabilities; full Windows implementation!
- **No risk, 30 day money back guarantee!** *$495
- **Free 1-800 tech support**
- Distributor & VAR inquiries welcomed

Call now for a Free Demo Disk
1-800-289-6293

Mayer Automation Group • Division of Meyer Electric Supply Company, Inc.
3405 4th Ave S. • Birmingham, AL 35222 • (205) 583-3500 • Fax: (205) 323-0886

CIRCLE 509 ON READER SERVICE CARD

New Version

Use your PC to Master Japanese *and* Chinese

Enjoy mastery of Asian languages with *Smart Characters for Students*™ word processing, reading, writing, translating, and learning tool for PCs. Handy on-line references, dictionaries, *furigana* and English glossary annotations speed reading, writing, and translation. Learn and use *kanji* and *hanzi* rapidly and effectively while creating your own letters, faxes, and vocabulary lessons. Version 2.9 is both DOS and Windows compatible. Just $99.95 in stores or directly from us. Call or write for a free brochure.

知 字

Apropos Customer Service 800-676-4021
8 Bishop Street, Arlington, Massachusetts 02174

BIBLE BOOKSTORE ON DISK!

Since 1981 we have offered Full Featured, Fast and Friendly Bible study software.

800-423-1228
Free Catalog!

BIBLE RESEARCH SYSTEMS
2013 Wells Branch Pkwy. #304
Austin, TX 78728 512-251-7541

The Mail Order Wizard™

Everything you need to manage your growing phone-order or mail-order business.

- Order processing
- Mail list management
- Electronic charge processing
- Inventory control
- UPS manifest
- Financial reporting
- Ad forecasting

Winner of
Home Office Computing's
General Excellence Award

Systems start at $695
Call for free info or $20 demo.

The Haven Corporation
1227 Dodge Ave., Suite PCC93
Evanston, IL 60202-1008
800-676-0098 or 708-869-3553

CIRCLE 505 ON READER SERVICE CARD

88% of PC/Computing subscribers who know Marketplace have purchased hardware in the past 12 months, or would consider doing so, after seeing an ad in the section.

Did they buy from you?

Source: '93 PC/Computing Marketplace Subscriber Study
Base: The 66% of subscribers who have noticed Marketplace

Logos shown were designed with Logo SuperPower® elements

Logo Design Software

Logo SuperPower ® is a large graphic database. You use one or more "design elements" and modify them to create world-class logos in minutes. There are over 2,000 logo design elements, AI, EPS format.

SuperPower 660 (660+ design elements)....$119
Upgrade 300 (300 new design elements).....$99
Upgrade 450 (450 more new elements).....$49
Upgrade 400 (400 more new elements).....$79

Buy any module, or buy them all for just $279.00. (Buy 1 now - buy rest at 30 days - get all for $279) For the PC; Requires Corel Draw, A&L; Micrografx, Illustrator, Freehand or similar drawing program.

To order, or for information, call:
(800) 548-5546
Decathlon Corp. • 4100 Executive Park Dr.
Cincinnati OH 45241
Phone (513) 421-1908

CIRCLE 514 ON READER SERVICE CARD

Voice Mail Cash Machine

Press 1 for sales, 2 for service, 3 for a live operator.

Make thousands of dollars effortlessly by installing our voicemail in your 286/386. Use it to answer your home office phone, rent pocket-pagers, advertise products or operate a pay-per-call service using credit cards, passwords or a 900#. Systems start at $295.

Call 24 hours: 800.283.4759
Int'l & Demo line: 818.718.9560

DemoSource™
The Voice Application Superstore
8345 Reseda Blvd, Ste 202
Northridge, CA 91324 USA

CIRCLE 517 ON READER SERVICE CARD

Desktop Mapping

that makes Business sense

Geo Write is More than maps! It's a Tool for your Business!
Exceptionally Easy to Use!!!

- Place Your Sites on the Map, by Zip, Phone, or City
- Build and Manage Territories
- Analyze Sales Geographically
- Assist in Planning Routes
- Determine Site Locations

Variable Zoom, 120,000 cities, Highways, More. Optional Detailed County Maps are available.

Order Now! Only $349
Call 405-692-1683

CIRCLE 519 ON READER SERVICE CARD

FIND BUSINESS SOFTWARE FAST

Thousands of titles, descriptions & prices from hundreds of software developers who have software in over 300 market niches, all with excellent user referrals, tech support, money-back guarantee.

Catalog $ 25 on disks or by BBS download.

Updated monthly & growing daily. Dealerships available.

Bill $100k Thru Your Computer.

World Class Software, Inc
245 Elwa Pl., West Palm Beach, Fl 33405

BBS 407-547-8759
Fax 407-547-1703
Tel 407-585-7354

FREE SAMPLES!

FREE LOG ON & DOWNLOAD.

CIRCLE 523 ON READER SERVICE CARD

FREE PROGRAMS

That's right! Now you can free your software from those troublesome hardware locks. Don't buy a new program because they won't replace your lost or stolen hardware lock.

Our SAFEKEY software programs are guaranteed to UNLOCK the following:

TANGO PRO CADKEY 3D-STUDIO
SURFCAM4 MASTERCAM TOPAS
EZCAM MICROSTATION & MORE

*NEW – If your program uses ANY Rainbow Technologies Inc. lock, protect it from being lost or stolen with the PC-KEY and now the WINKEY

From $300 plus S&H
(609) 390-2799
(609) 390-3750 FAX

IMAGINE THAT
1 EVERGREEN DR. SEAVILLE, NJ 08230

CIRCLE 515 ON READER SERVICE CARD

TWO CELLULAR PHONES ONE NUMBER

PROGRAM ESN & NAM
On NEW CELL Phones
MOTOROLA ABOVE 9122
Panasonic, Technophone, NEC, Diamondtel, Nokia
Other makes and models available
No Soldering ! Software complete with cable to connect to PC
sold for educational purposes only
Software prices from $395.
Or buy this Motorola Flip Programmed only $495
Why pay two monthly bills !

CELLSOFT
609-751-2242
Fax 609-751-5549

CIRCLE 518 ON READER SERVICE CARD

CD

CALL 800 CDSOURCE

Dial 1-800-CD-Source

*Clipart Super Clipart $25
*Childrens Putt Putt $22
*Business Business 500 $45
*Games Johnny Rock $39
*Shareware S.W. Platinum $29
*Adult Dream Machine $59

FREE 500 title CD ROM catalog with any purchase

SOURCE

CIRCLE 520 ON READER SERVICE CARD

COMPUTER GRAPHICS

- Animation
- Desktop Publishing
- Photo Retouching
- Computer Illustration
- Multi Media Production

1-800-225-9023

INTERNATIONAL FINE ARTS COLLEGE
1737 N. Bayshore Dr., Miami, Florida 33132
or Fax your inquiry to: (305) 374-9933
Classes start in Jan. & Sept.

Name
Address
City State Zip
Phone ( )
Yr of HS Graduation Age

CIRCLE 522 ON READER SERVICE CARD

NUTRITION SOFTWARE - $11.00

3-disk/3prgm set.
1,200,000 prgms sold!
Analyzes foods, workouts, fat, cholesterol, etc. Creates menues. Provides guidelines. Not shareware, not public domain.
Send $11.00 and specify disk size & IBM or Mac.

SATISFACTION GUARANTEED

OHIO DISTINCTIVE SOFTWARE
4588 Kenny Road,
Columbus, Ohio 43220
614-459-0453

CIRCLE 516 ON READER SERVICE CARD

STUDENT-TEACHER SCHOOL DISCOUNTS

"LATEST VERSIONS"
"FULL PACKAGES"

QUARK XPRESS 3.2 $299
PAGEMAKER 5.0 $249

3D STUDIO DOS & WIN	$399
BORLAND C++ 4.0	$185
CODA FINANCE 3.0 WINDOWS	$249
FRACTAL PAINTER 2.0	$179
FRAMEMAKER 4.0 WINDOWS	$239
LOTUS 1-2-3 4.01 WINDOWS	$129
M Y O B. W/PAYROLL	$80
SMART SUITE 2.1	$219
STRATA STUDIO PRO 1.0 DOS	$495
WORD PERFECT 6.0	$135.

Call for products by Adobe and Symantec! Microsoft products available to qualified students, teachers and schools

CALL FOR FREE CATALOGUE
800-289-3275
VISA, M/C, AMEX & SCHOOL P.O.'S ACCEPTED

THE SOFTWARE SOURCE CO, INC.
2517 Hwy 35, Bldg N, Suite 201
Manasquan NJ 08736
Fax (908) 528-9378

CIRCLE 573 ON READER SERVICE CARD

B.S. & M.S. In Computer Science

- ALL COURSES HOME STUDY
- Approved for tuition reimbursement by leading corporations
- Increase your earning power
- Join students from leading computer companies
- Ada and C++ courses available

FOR FREE INFORMATION CALL 1-800-767-AICS or 1-205-323-6191

AMERICAN INSTITUTE OF COMPUTER SCIENCES
The leading edge of learning

RFFlow

Professional Flowcharting
For Microsoft® Windows™

Create professional, fine quality charts quickly and easily. Call for free trial disk: (303) 663-5767 FAX (303) 663-4689

$129.95 RFF ELECTRONICS
6552 Canyon Court, Loveland, CO 80538

CIRCLE 521 ON READER SERVICE CARD

MOST SIGNIFICANT BITS, INC.

(800) 755-4619 EXT 210

Mon-Fri 10am - 7pm Sat 11am - 5pm EST

Info: (216) 529-1888

Fax: (216) 221-4411

VISA MasterCard DISCOVER

CD-ROM Specials

Reference

11 Million Business Phone Directory 1994 ... 24
9-digit Zip Code 1994 ... 24
Animals Of San Diego Zoo (MPC) ... 18
Bibles & Religious ... 19
Business Heaven ... 19
Compton's Interactive Encyc. 1994 (MPC) ... 29
Cookbook Heaven ... 15
Dinosaur Safari (MPC/MAC) ... 19
Dr. Book Of Home Remedies (MPC) ... 22
Encarta 1994 (MPC) ... 69
Free Phone ... 29
Gardening ... 19
Grolier's M/M Encyclopedia (MPC) ... 49
Guinness M/M Disc Of Records (MPC) ... 24
Home & Office Legal Guide ... 19
King James Bible (MPC) ... 29
Microsoft Bookshelf 1994 (MPC) M/M ... 49
Multimedia Audubon Mammals or Birds ... 19
National Parks (MPC) ... 20
Our Solar System ... 13
Parenting ... 19
Pill Book (WIN/DOS/MAC) ... 39
Precision Mapping ... 79
Reference Library ... 29
Straight From Heaven (Religious) ... 17
Street Atlas USA V2.0 ... 99
Total Baseball M/M 1994 (DOS/MAC) ... 22
U.S. Atlas V4.0 (MPC) ... 18
U.S. Civil War ... 29
U.S. History ... 19
World Atlas V4.0 (MPC) ... 18

Sound & Music

Dr. Music ... 15
Encyclopedia Of Sounds 1 or II ... 13
Jazz: A Multimedia History (DOS/WIN) ... 29
MIDI Music Shop For Windows ... 15
PC Karaoke Original Hits ... 19
Sound Library 2 ... 19
Sound Waves 1 or 2 ... 17

ClipArt & Graphics

Animation Festival ... 17
Cameron's Fine Art ... 29
CD Cel 3.7 ... 29
Clipart Heaven ... 29
Clipart Heaven 2 ... 29
Color Magic Clipart (WIN/DOS/MAC) ... 18
Corel Artshow 4 ... 29
Dr. Font ... 15
Font Heaven (1200 Fonts) ... 19
Font Platinum ... 15
Icons & Wallpaper ... 25
Image Library II ... 29
Kodak Photo CD Software ... 15
Nature Graphics ... 19
Personal Photo CD ... 19
Photo Gallery ... 15
Pixel Perfect Graphics ... 29
Publishers Paradise ... 20
Publishers Platinum ... 15

Shareware

CICA MS-Windows ... 15
Dr. Windows ... 15
Hobbes OS/2 Archives ... 29
Night Owl V12 ... 29
PC-SIG 15 ... 24
Pier 4 Shareware ... 29
Shareware Explorer (4 Discs) ... 49
Shareware Heaven 3 ... 29
Shareware Overload Trio (3 Discs) ... 24
Shareware Studio IV ... 19
Simtel (MS-DOS Archives) ... 15
So Much Modem Madness ... 29
So Much Shareware IV ... 19
Win Platinum ... 15
Windows Heaven ... 19
Windows Shareware ... 19

Call For Our Latest Catalog

MSB 15508 Madison Ave. Lakewood, OH 44107

CIRCLE 529 ON READER SERVICE CARD

24-Hour Order Line!

CD-ROM's

Price Breakthrough!

Games		Kids	
7th Guest	52.9	TFX	$37
C.H.A.O.S. Cont.	$19	Arthur Tchar Trub.	$19
Chessmaster 4000	$19	Just Grandma & Me	$19
Critical Path	$29	New Kid on Blk	$35
Day of the Tentacle	$29	Putt-Putt Goes Mo	$21
Dragon's Lair	$36	Putt-Putt Joins Pol	$21
Dune	$24	Ruff's Bone (Lv)	Bn$35
Gabriel Knight	$27	Tortoise & the Hare	$35
Iron Helix	$29	**Reference**	
Kings Quest V	$15	Compton's Int Encl	$39
Kings Quest VI	$22	Family Cookbook	$21
Megarace	$29	In Copsy of Writing	$39
Microsoft Golf	$29	Mayo Clinic	$21
MYST	$49	MS Bookshelf '94	$39
Return to Zork	$25	MS Encarta '94	$59
Sim City 2000	$29	Roadmap	$19

Fast service at unbelievably low prices!
All in-stock orders are shipped within 24 hours.
2-Day Shipping is now standard! We ship all orders (U.S. only) via Airborne Express for the low cost of just $6.00 per order. Overnight shipping is also available for just $9.00 per order. Order by Phone, Fax or Mail. Please call or Fax for international shipping rates. We accept VISA, MC, Check or Money Order.

Computer Gallery Call or write for free P.O. Box 409, Perrysburg, OH 43552 catalog!
Ph:(419) 874-0288 Fax:(419) 874-2944

CIRCLE 525 ON READER SERVICE CARD

Consolidated CD ROM

Worldwide Suppliers of CD ROM Software

Always new titles!

- Business
- Clip Art
- Games
- Music
- Religion
- Travel
- Caddies
- Education
- Literature
- Reference
- Shareware
- Adult

Call TOLL-FREE for a FREE Catalog

1-800-8-CD-ROMS

Unconditionally Guaranteed

Resellers Wanted

Multimedia & Memory Expansion

313 E.Ninth Street • Philadelphia, PA 19116 • USA
(800) 8-CD-ROMS • (215) 276-7637 • Fax (215) 276-7814

CIRCLE 526 ON READER SERVICE CARD

CD-ROM!

1-800-233-0010

CD-ROM TITLES:

5 ft. 10 Pak	31
Best of Win Shareware	19
CD Deluxe Pack 4	21
Grolier's Encyc. New	29
Home Office Executive	42
Just Grandma & Me	27
Shareware Overload Trio	19
Top 50 Games for Win.	24
Total Baseball 1994	17
Utilities Platinum	19

Call for Adult Titles and more!

CD-ROM DRIVES:

PLEXTOR, CHINON, NEC, MITSUMI, SONY and more!

SOUND CARDS, SPEAKERS, MM KITS AND MORE!

Call for a Free Catalog!

Multimedia Specialists

P.O. Box 55164 Madison, WI 53705

Tech Support/Other info: (608) 233-4833

CIRCLE 527 ON READER SERVICE CARD

WINDOWS SOFTWARE

YOUR DIRECT SOURCE— 24 HOURS A DAY!

- MULTIMEDIA
- ENTERTAINMENT
- BUSINESS
- SPREADSHEETS
- WORDPROCESSING
- UTILITIES
- DESKTOP PUBLISHING
- GRAPHICS

POPULAR CD-ROM TITLES AVAILABLE AT GREAT PRICES!

- BUSINESS
- REFERENCE
- GAMES
- TRAVEL
- ADULT
- CHILDREN'S

DS/2, UNIX & MAC SOFTWARE AVAILABLE

TO ORDER, CALL TOLL FREE 24 HOURS A DAY

WESTERN RESERVE SOFTWARE

800-737-0237

Fax 216-231-1919

PO'S WELCOME, GOVT/EDUCATIONAL PRICING

CIRCLE 528 ON READER SERVICE CARD

Your Best Buy on CD's

Call for FREE Catalog 800-240-0055

TOP SELLERS			
Seventh Guest	$19.	Doom Companion CD	$19.
Compton's Encyclopedia	$94.	Games Platinum	$15.
Night Owl 13	$25.	Gardening	$9.
5 foot 10 packs (10 titles)	$35.	Arthur's Teacher Troubles	$19.
Mayo Clinic	$19.	Putt Putt Joins the Parade	$17.
Maddog McCree	$19.	**NEW TITLES**	
Return to Zork	$19.	Leisure Suit Larry 6	$45
Megarace	$37.	Outpost by Sierra	$46.
Where is Carmen San Deigo?	$19.	Wayo Clinic Family Pharmisis	$47.
Just Grandma & Me	$19.	Seawolf	$46.
Software Valut Emerald	$17.	Under a Killing Moon	$52.
Ms. Bookshelf 1994	$49.	Inca II	$52.
Ms. Encarta 1994	$69.	Ruff's Bone	$22.
Kodak Photo CD Access	$15.	Wind the Gods	$35.
Shareware Trio Overload	$19.	Maddog II	$44
Street Atlas II	$37.	Jump Raven	$45.
The Linux Quarterly	$19.	Darkseed	$23.
American Residential Phone	$39.	Aces over Europe (or Pacific)	$42.

Shipping $7.00 per order. Returns for same item only. Call for international rates (810) 731-3770.

RACEWAY CD

44443-B Phoenix, Sterling Hts, MI 48314

CIRCLE 530 ON READER SERVICE CARD

FREE SOFTWARE

Choose from:

Games, Education, Desktop Publishing, General Interest - Windows™ or DOS

Only $2.50 service charge per collection. Credit Cards Only.

MICRO STAR Software Club™

1-800-444-1343

Satisfaction Guaranteed

CIRCLE 531 ON READER SERVICE CARD

FREE CATALOG

1.800.447.2181

Large Quality Selection Virus-Free Software

PC SHAREWARE

ASP member

1016 Grand Ave. • San Diego, CA 92109

619.272.6673

CIRCLE 537 ON READER SERVICE CARD

AMIGA • IBM • MAC • WINDOWS

GENERAL INTEREST • CLIP ART • GAMES • FONTS

You Are Invited

to sample the world's finest selection of leading shareware.

Presented by the world's largest distributor of software.

Call for information

SMC

SOFTWARE OF THE MONTH CLUB®

5816 DRYDEN PLACE • CARLSBAD, CA 92008

PH: 619-931-8111 EXT. 509 • FAX: 619-929-1163

CIRCLE 538 ON READER SERVICE CARD

SOFTWARE LABS

WORLD'S LARGEST SHAREWARE DISTRIBUTOR

Selected by **IBM** as a supplier for software testing

See why **IBM** chose our professionally tested virus-free library.

Call TOLL FREE or write for our free world famous 92-page catalog with exclusive 12 BONUS DISK offer.

8700 148th Avenue, NE
Redmond, WA 98052

800-569-7900
FAX: 206-869-1503

CIRCLE 532 ON READER SERVICE CARD

ICA Software

DARE TO COMPARE

Highest Quality
Lowest Price
SHAREWARE
Guaranteed!!!

Free Catalog
800-331-3065

FAX: 203-459-0823

P.O. BOX 272 Monroe, CT 06468-0272

CIRCLE 533 ON READER SERVICE CARD

ELECTRONIC PRESENTATION SERVICES

A Service of 24 Minute Photo Orlando, FL

Kodak

- Slides/Overheads
- Presentation Graphics
- Photo Business Cards
- Composites/Special Effects
- Internegatives
- Hi Res Scanning Services
- Photo CD Transfers
- Photo Restoration
- Professional Photo Laboratory
- Many Specialty Services...

8 Hour Digital Output $3.99 Slides

Limited Time Offer Mail to Orders Only

1-800-240-7600

1123 Florida Mall Avenue, Orlando, FL 32809 • (407) 240-7600
24 Hour BBS: (407) 240-3700

CIRCLE 536 ON READER SERVICE CARD

Computer Help Desk

= $

The clock doesn't start until you're speaking with one of our tech reps. Our clients are **NEVER** put on hold!

1 (900) 407-3700

Mon - Sat $2.50/min.
10 am - 8 pm Must be 18

Tech support for PC setup and all major software applications

CIRCLE 539 ON READER SERVICE CARD

SHAREWARE SOFTWARE

DISKS & BBS

LARGE PROGRAMS ON SINGLE 3½" DISKS

ALL DISKS SAME PRICE PLUS FREE DISKS!

FREE CATALOG!

800-777-5636

CWI SOFTWARE

PO BOX 4851 • ANAHEIM, CA 92803

CIRCLE 572 ON READER SERVICE CARD

IMAGERS®

OVERNIGHT $4.95 Slides & Canons POSTSCRIPT

Digital Output & Production Center

- Slides/Overheads
- Dye-Sub Output
- Large Color Posters
- Canon Fiery Lasers
- Slide Duplication
- 4x5 Neg/Pos/B&W

Photo CD™

Scans $.90

(800) 232-5411

22-7th St. • Atlanta, GA 30308 • 404-873-5353

CIRCLE 534 ON READER SERVICE CARD

Be Your Own PC Expert

Don't let them rip you for software and hardware. **How to Maximize Your PC** is a 960 page manual that comes with free diskettes, and ready to use programs and utilities. Just $59.95. Deduct $10 when you order with check or credit card! Ask about our quarterly supplements. 400093

30-day no-risk guarantee!

1-800-222-WEKA

WEKA Publishing, Inc.

1077 Bridgeport Ave, Shelton CT 06484

CIRCLE 535 ON READER SERVICE CARD

DUPLICATION FROM $.49

HIGHEST QUALITY MEDIA

From $.49 (5.25") and $.80 (3.50")

- **All Diskette Formats**
- **Custom Labels**
- **Diskette Mailers/Accessories**
- **Assembly Services**
- **Generous Volume Discounts**

FORMATTED DISKETTES

QTY 250	SONY VERBATIM	OEM GENERIC
3.5" DD	$.47	$.45
3.5" HD	$.57	$.53

- **10% Discount on First Order**
- **DOS, Macintosh, or Custom Formats**
- **Colored Media add $.05**
- **Private Labeling/ Volume Discounts**

800-255-3142

Diversified Systems Group, Inc.

PO Box 1114, Issaquah WA 98027

CIRCLE 540 ON READER SERVICE CARD

Gamma 龍

NEW!

UniType™

Localization Kit for Windows

From $99.95. Use with DTP, word processing, database, presentation graphics, e-mail and fax. Even complex languages are easy to type because of automatic contextual characters, ligatures and diacritic positioning.

Here's our guarantee: If you are not comfortably using the foreign language of your choice in your Windows software within 30 days, return the product for a full refund.

Type foreign languages in your favorite Windows applications as easily as you type English!

Arabic, Biblical, Chinese, European, Greek, Hebrew, Indian, IPA, Japanese, Korean, Persian, Russian, Sanskrit, S.E. Asian, Tibetan, Urdu, & more – scalable fonts for all the world's languages.

ش

Ask about our Expert Translation Service and Products!

Call the WinLanguage™ experts!
Gamma Productions, Inc.
12625 High Bluff Drive #218, San Diego, CA 92130
Sales. 800-97-GAMMA Tel: 619-794-6399 Fax: 619-794-7294

CIRCLE 541 ON READER SERVICE CARD

Foreign Languages

Software - Hardware - Systems

All LANGUAGES

Translators -Tutorials -Fonts
Dictionaries -Word Processors
Spell Checkers - Keyboards

Best Prices-Best Source-Best Service

800-308-8883

Convert all English Window apps into any Language $79
English-Japanese Dictionary $29
English-Spanish Translator $39
Six Language Translator $29

Factory direct Hardware & Discounted Software

486 DLC-40 LOADED $645
FAX/MODEMS 14.4 $89 !!!
WinFax $9 Procomm Plus $59
TransLanguage Inc. Fax714-998-1296

CIRCLE 543 ON READER SERVICE CARD

Jet-Master

Re-usable Jet Printer Refill. Lowest cost/recharge, Black & Color. Waterproof inks.

From $20.95

MacInker

Eliminate ribboo costs. Re-ink your ribbons automatically-5¢ recharge, better than new printing and longer printhead life.

Over 250,000 sold

Epson MacInker 49.95
Universal Cartridge MacInker ..79.95
Multicolor Adapter.....40.00

Call for comprehensive catalog!

Computer Friends, Inc.
14250 NW Science Park Drive
Portland, OR 97229
Order 1-800-547-3303
Tel. (503) 626-2291
Fax (503) 643-5379

CIRCLE 544 ON READER SERVICE CARD

Software & Hardware Catalog
60 pages of the hottest Software & Hardware products

FREE CATALOGS

Computer Supplies Catalog
Over 225 pages of the newest and most competitively priced computer products, including:

- Media & Supplies
- Accessories
- Networking & Data Communications
- Power
- Computer Furniture
- Hardware & Software

GLOBAL
Call 1-800-8 GLOBAL
Fax 1-516-625-6683
NY • CA • GA • IL

CIRCLE 545 ON READER SERVICE CARD

Rite Hite PRODUCTS

Height Adjustable Ergonomic & Hardware Management Products at DISCOUNT PRICES

• Undermount Keyboard Support

• C.P.U. Holders • Wrist Rests
• Monitor Stands • Mouse Platforms

1 800 272-6514

CIRCLE 546 ON READER SERVICE CARD

TONER

PRICES STARTING AT $40

Your Cartridge Remanufactured
UPS RETURN INCLUDED

MORE TONER • COLORS
RICHER BLACKS
FULLY TESTED

We now service XEROX 1012, 5012 & 5014 copy cartridges.
Save Even More with our new 40,000 page "Duro-Drum"

1•800•442•6288
DISCOVER/MC/VISA
Southern Cartridge Service, Inc.
33 Mathews Drive
Hilton Head Island, SC 29926

CIRCLE 547 ON READER SERVICE CARD

76%

of PC/Computing subscribers advised an average of 22 friends and business colleagues on purchasing PC products in the past twelve months... half of which resulted in purchases

Are they recommending buying from YOU?

Profit with the influentials.

Call your PC/Computing Marketplace account representative today at

800 825-4237.

Source: 1993/94
Plan to Buy Study II

San Francisco's Premier Adult Gay Men's Online Service has NOW gone Nationwide!

- Local access from over 1,000 US cities!
- Live uncensored group & private chat!
- Online, interactive, multi-player games!
- Lively salon style public forums!
- Over 20,000 Adult rated GIFS & files!
- MatchMaker online databases!
- 50+ lines available 24 hours a day!
- Gay owned and operated, your privacy assured!
- *Much, much more!*

For your local access number, information, & signup, CALL:

(415) 703-8200

Set modem to 8/N/1. You must be 21 or older.
Finally...a national Adult Gay men's BBS!

EYE CONTACT

Sexy Software™ SEXY DISKS™

Sexcapades™ . . . The GAME
The First Adult Game with TRUE SOUND and 256 Color VGA Graphics
For that evening you won't forget with a loved one or group of very close friends. Fulfill your sexual desires find out how your partner would really like to make love. Over 80 Color VGA Scenes • Real Voices Guide the Action • Foreplay Option • Play with 2-4 Those Friends. SoundBlaster™ supported!

SPECIAL SALE PRICE $ 49

NEW! Sexcapades . . . the Mini-Movie
See the resolution of a DUAL SPEED Disk on your desk crew - the first movie using a 600K/sec transfer rate - see how created a 40MB movie containing the best scenes from our Sexcapades movie - you can install the movie in 10MB scenes to conserve disk space - shipped on 25 1.44 MB disks - SoundBlaster support. *Regular Price $65.* ***SPECIAL INTRODUCTORY PRICE $49.***

NEW! 101 Shots – We have picked 101 of the hottest pictures in 800 X 600 SVGA from our library of over 1 million pictures! Only for the truly discriminating collector. *Regular Price. $49* ***SPECIAL INTRODUCTORY PRICE $35.***

" Now You Can Have Your Own GIRLFRIEND" . . . a sensuous woman living in your computer!
Introducing **VIRTUAL WOMEN**. You can watch her, talk to her, ask her questions and relate with her. Over 100 actual VGA photographs allow you to see your girlfriend as you ask her to wear different outfits, and guide her into different sexual activities. An artificial intelligence program with a 3000 word vocabulary that LEARNS the more you use it. She will remember your name, your likes and dislikes. **GIRLFRIEND** comes with the base software and **GIRLFRIEND LISA.** Req. 10MB of free space
SG3 GIRLFRIEND - Special Introductory Price **$69. FREE** - Second GIRLFRIEND Just Added NEW! **SG7 GIRLFRIEND TERI** - 300+ PICTURES Price **$79. NEW! VOICE KIT $29**

ORIGINAL Sexy DISKS - 6 disk set with movies, pictures, games ***$32***
ADD $4 S/H • 3.5" or 5.25" DISKS IN CHANGER AND SEASONS • IN VIA AOL™ • MUST STATE AGE (OVER 21 YEARS)
VISA/MC Orders Only: 800-243-1515 Ext. 600VI2 / 24 HRS / 7 DAYS
FAX (215) 997-2571 • Or: CK/MO to Sexy Software. P.O. Box 220 , Dept. 600VI2, Hatfield, PA 19440

Sexy Software™ SEXY CD-ROMS™

SUPER CD-ROM SALE
ALL CD-ROMS: $69 EACH OR 3 FOR $149

Sexy FLIX
FULL LENGTH DIGITAL MOVIES - OURS EXCLUSIVELY!
PLAN 69 FROM OUTER SPACE – Interactive science fiction sex extravaganza! 2 minutes of t - play mouthfeel or play endearment movie with scenes from original Plan 9 From Outer Space - also create unlimited DIFS from movie
POPAMMANIA – 2 CD set – contains 1100 MB of European movies in QDS and Windows - with a fantastic adult arcade game containing 4 adult games within the master game - nothing else compares to this disk!
Sexcapades . . . The MOVIES – See incredible uses of a mouse and a joystick in an amateur movie of our Sexcapades game
• **KINO** $\sum$*** – Dirtiest dinosaur movie ever made • **TOO NAUGHTY TO SAY HO** - Harry Reems on Oregon Lumber • **SEX GAMES** - Hooker shenobs dating service
NO HARD DISK SPACE REQUIRED - WINDOWS NOT REQUIRED

Sexy CD-ROMS
Sexy CD #1 The premiere adult collection – 650 MB of action with over 2500 VGA pictures, cinemas, cartoons, games, sound files. DAME - COMPANIE
Sexy CD #2 an exclusive collection containing over 1000 Super VGA pictures (1024 x 768 x 256) and over 300 MB of true 24 bit color. These are pictures that cannot be found anywhere else! The women and the quality are stunning
Sexy CD #3 another collection of over 650 MB of the hottest pictures available. Over 3,000 VGA pictures, movies and utilities that will have you spending days just trying to see it all
MENU DRIVEN VIEWING - NO DUPLICATION

MIX & MATCH CD-ROMS / Sexy PIX™
ASIAN LASS • AMOUREUX • BAMBI GIRLS • BEAUTY L.A. • BIKIPANTHER • B.J. DREAM MACHINE • BLIND DANCER • BANNER TARE ALL SEYMOUR BUTTS • BERRIE DICKS DALLAS, BOCACHULE BEAUTIES • DO OPERAHEIRS • HOT FIX 4 U • TOTAL FANTASY

CIRCLE 548 ON READER SERVICE CARD

FOR ADULTS ONLY
You must be over 21 to access

LIFESTYLE
Meet sexy singles/couples on the world's hottest adult chat system—Lifestyle BBS.
Less than 30 per hour
Log on: 516-689-5390

AND

GRAFIX
Computer pictures so hot they could melt your modem.
Log on: 516-689-2853

SUPER CHEAP • 100% PRIVATE
Local access from 500+ cities

CIRCLE 550 ON READER SERVICE CARD

STAR WARE
PUBLISHING CORPORATION

Call 1-800-354-5353
to order or for our FREE catalog
or FAX 305-426-9801
Foreign orders call 305-426-4552

NEW RELEASES!!
After Midnight
Adult Movie
Screen Saver
and
ADVENTURES OF MIKKI FINN
QuickTime Movie for Double-Spin CD-ROM Drives Only

STARWARE BBS 305-428-0012

CIRCLE 554 ON READER SERVICE CARD

ADULT CD-ROMS
Guaranteed Lowest Price! We BEAT any Advertised Price!

INTERACTIVE CDs

Vampire's Kiss* *new* Navigate, through virtual 3D castle	sgl	$59
The Barlow Affairs* Playboy Playmate® Teri Weigel	sgl	$39
Interno* Playboy Playmate® Teri Weigel	sgl	$39
Virgins 1 & 2 *new* Thru, 3 girls, their first time on film	sgl	$49 ea
Dream Machine	sgl	$54
Seymore Butts	sgl	$54
Maddams Family* Adventure through 3D mansion	sgl	$49

*Special Edition available for Asia

Hot!

SPOT LIGHT
Maddams Family
"...offers one of the better examples of how adult CD-ROMs are interactive."
CD-Rom Today Magazine June 1994

DIGITAL ADULT MOVIES

Baby's Got B_tt Those lovely scenes of B_tt	sgl	$25
Hidden Obsessions Penthouse Pet® Jamme Lindemulder	sgl	$25

SPOT LIGHT
Virgins
"...excellent girls! excellent scenes"
AVN Magazine January 1994

PHOTO DISCS

Elite American Girls Volumes 1&2 230 photos of top nude American models in each volume	sgl	$35 ea
Elite European Girls Volumes 1&2 250 photos of top nude European models in each volume	sgl	$35 ea
Adult Sampler CD		$9.95

SUPER SAVER BUNDLES!!

Dream Bundle 3 CD ROM Titles (Dream Machine, Baby's Got B_tt, Interno)	sl&2	$99
Vampire Bundle 3 CD ROM Titles (Vampire's Kiss, Baby's Got B_tt, Barlow Affairs)	sl&2	$99
Maddams Bundle 3 CD ROM Titles (Maddams Family, Baby's Got B_tt, Interno)	sl&2	$99
Virgins Bundle 3 CD ROM Titles (Virgins, Baby's Got B_tt, Barlow Affairs)	sl&2	$99
Gorgeous Girls Bundle 3 CD ROM Titles (Virgins, Elite American & European Girls)	sl&2	$99

CK/MO to: **CD DISCOUNT**
21115 Devonshire St. #304 Chatsworth, CA 91311
Domestic: $5.95 for shipping & handling.
Foreign: $50.00 for shipping & handling.
Foreign orders: 818-772-6969
Fax orders: 818-773-8314

VISA/MC ORDERS : 1-800-990-9077
Must be 18 or older to order. Void where prohibited and restricted.

CIRCLE 549 ON READER SERVICE CARD

91% of PC/Computing subscribers who know Marketplace have purchased software in the past 12 months, or would consider doing so, after seeing an ad in the section.
Shouldn't they see your ad here?
Call 800-825-4237 Today!
Source: '93 PC/Computing Marketplace Subscriber study
Base: The 66% of Subscribers who have noticed Marketplace

SEXY MODEM
Call from home or office!
•The Ultimate BBS•
- UNLIMITED ACCESS
- 100,000 Shareware & GIF's, Windows, Mac and DOS files
- Free Internet Accounts
- Sexy Network Chat with Singles and Couples
- Unlimited Downloads
- Up to 16.8k on all 96 Lines
- New GIF's posted daily by our photographers

FREE
1-217-792-3663
Must be over 21 to access
Customer Support Voice Line 415-281-4429

CIRCLE 551 ON READER SERVICE CARD

TEXAS

Table Dance

The Interactive Gentleman's Club Game with full motion!

QUICK TIME MOVIES

THE FIRST IN A SERIES **$59.95**

LSU MULTIMEDIA

VELVET DREAMS — ONLY **$49.95**

FANTASY MOVIES & PICS

CD-ROM BUNDLE **$89.95**

Shipping & Handling add $4.00 per order Add $5.00 for 2-day/ $10.00 for Foreign Visa / MasterCard / MAIL ORDERS TO: LSU Multimedia 115 W. California Blvd Box 408 Pasadena, CA. 91105

Order toll free / Must be 18+

1-800-220-0578

PREVIEW DISC **$19.95**

CIRCLE 593 ON READER SERVICE CARD

SEX

Adult Video

Adult Novelties

Adult Sex Toys

Superb GRAPHICS! View our Video Catalog with your computer

Toll Free Info & Order Line/Network Viewing (407) 905-3004

24 hr Shopping

Nationwide TOLL FREE Access

Dial By Modem 950-1288

At 'Please Sign-on' type: TAKE 2

Computer Shopping

For Adults Only — Must be 18 yrs of age or older

CIRCLE 555 ON READER SERVICE CARD

Where Adults Come To Play!

The World's Choice For

HOT MODEM FUN!

- Great For Couples and Singles!
- CHAT LIVE With Thousands of Ladies and Gents in Groups or Private!
- Tons Of Sizzling Hot Message Areas!
- Large GIF and Shareware Libraries!
- Matchmaker "DATING-BASE"!
- Live Competitive Tournament Gaming!
- NEW Modem to Modem Gaming!
- Local Numbers In Over 800 Cities!
- Plus Much Much More!

ODYSSEY ONLINE

CALL NOW BY MODEM For Special Promos & Information On Our Newest Features Including INTERNET Access!

Over 21 **818-358-6968** 8/N/1

CIRCLE 556 ON READER SERVICE CARD

GO BEYOND ADULT

You must be 18 years old to access

GRAFIX

Computer Pictures HOT Enough To Melt Your Modem.

The hottest, most erotic gifs available anywhere. Every file is worth downloading.

You can't say you've seen it all, until you've seen Grafix.

Log on: 516-689-2853

SUPER CHEAP

Real Local access from 1000+ cities

CIRCLE 557 ON READER SERVICE CARD

GOURMET GALLERY

MELISSA'S BBS

original gifs+|pegs

thumbnails+closeups

50 new pics/week

7 online cd-roms

16 lines (1200-14.4)

7 gig of files

$2.75+/meg

no time limit

mc, visa, amex

408.956.5656

CIRCLE 597 ON READER SERVICE CARD

FREE GIFS!

Download some of the "Sexiest" Images from our Adult On-Line Magazine - FREE!

LACE, which has been rated #1 by its users offers you:

- Positively the best Color Photographs & Scans in the World! GIF's not available on any other BBS!
- VIDEO for Window's files. Watch our models come to life. They talk to you, entice you and show you why they enjoy Adult Modeling.
- GORGEOUS & Sexy Models both Amateur and Professional!
- LOCAL ACCESS #s for over 800 cities in the U.S.
- HIGH SPEED Access available on ALL lines 14.4 down to 1200 baud.

Set your modem to 8-N-1 and your terminal emulation to ANSI and dial:

(818) 709-4275

LACE

the on-line adult magazine

Questions? (818) 709-3795 (voice)

Adults Only • Limited Offer

CIRCLE 558 ON READER SERVICE CARD

*FREE ADULT CD-ROM SAMPLER

1-800-882-6959

Brand new 94 sampler features 28 HOT adult demos, including Seymore Butts II.

Why pay retail?

We will beat **any** price printed in this magazine

Call us LAST for :

- Lowest Prices
- Finest Quality
- Largest Selection
- Full Service
- Tech Support

LASER CONCEPTS

The first and still the best

20929-47 Ventura Blvd. #323 Woodland Hills CA 91364

Product info: (818)884-9437

*$6.95 S&H - Must be 18+

Hours 10 - 6 Mon.-Fri. Pacific Standard

CIRCLE 559 ON READER SERVICE CARD

66%

of PC/Computing subscribers buy directly from the ad in front of them. Put your ad in front of them, here.

Get your share. Call PC/Computing Marketplace at

800-825-4237

Source: 1992 Buying Trends Market Study Wave III

DIGITAL ADULT FUN

Immediate Media: The highest quality adult interactive entertainment direct to your door We carry ALL of the latest releases and will beat any advertised prices or specials.

ADV. OF SEYMORE BUTTS 1 & 2 — SPECIAL! ONLY $59.95
He's baaack! Guide Seymore and his camera straight to the best side of the girls of his dreams Best selling CD-ROM! As seen on CNN, Donahue and Playboy

NIGHTWATCH INTERACTIVE 2 — NEW RELEASE! $59.95
Control the nighttime action with hidden cameras and help from your luscious guide. P! Spears

THE GIFFY GIRLS PHOTO CD — A MUST HAVE! $44.95
100s of high-quality nudes of the sweetest wholesome sexy So Cal college girls A must see! w/Kisses & hugs.

FULLY INTERACTIVE DIRTY DEBUTANTES $59.95
Ed Powers goes extractive! Amateur stars

HIGH SOCIETY'S HOT WIRE $49.95
Naked with video, photo, show etc. a real treat.

NIGHTWATCH 1 $44.95
THE DREAM MACHINE $64.95
SEXY SAMPLER DISC $9.95

DIGITAL EXPERIENCES VIRTUAL VIXENS $89.95
Zane Interactive's high-res VR adventure

NEURODANCER $69.95
Evolve Interactive's wild erotic dreams

GIRLS OF VIVID 1&2 $34.95
NEW WAVE H****S 1&2 $29.95
ASIAN PALETTE HOT! $39.95

FREE 2-DAY SHIPPING
Buy 2 or more discs and get 1 free upgrade to second day shipping

OPEN 24 HOURS

All orders ship in plain packaging within 24 hours. We accept VISA/MC/Checks/M.O. $3 SHIPPING on mail-in orders TAX orders 2-day air add $4 E-mail for electronic catalog International orders accepted Must be an adult to order

IMMEDIATE MEDIA

4 FREEDOM, ST, CA 91407-1705
FAX: 714-675-1429
INFO: 714-675-4345
CATALOG BY FAX 415-883-1561
WE NEVER SELL OUR MAILING LISTS!

FREE COLOR CATALOG

1 800-240-6038

Internet: imedia@netcom.com

CIRCLE 562 ON READER SERVICE CARD

3-D SEX BBS

Images that Pull You into the Action Bodies that Pop Out of Your Screen

- HIGH RES. 3-D PHOTOS
- HOT MODELS TO CHAT WITH
- FREE 3-D GLASSES
- FREE DOWNLOADS

3-D Adult Models Floppy Disk Starter Kit... $9.95

3-D Adult "Windows" Screen Saver..... $29.95

Voice Orders **818-865-8210**

BBS **818-865-0496**

Adults Only. You Must Be Over 21 Years of Age.

CIRCLE 560 ON READER SERVICE CARD

Secret City
MULTIMEDIA INC.
FREE CD-ROM ADULT SAMPLER

A TASTE OF EROTICA - 20 SAMPLES OF THE FINEST IN ADULT ENTERTAINMENT.
ONLY $6.75 S/H, PHONE OR MAIL ORDER.
LOWEST PRICES! • HOTTEST TITLES!

VIRTUAL VIXENS $59.99
PENTHOUSE Interactive $79.99
DREAM MACHINE Interactive $55.99
HOT WIRE Interactive $55.99
SEYMORE BUTTS Interactive $52.99
NIGHTWATCH Interactive $49.99
MADDAMS FAMILY Interactive $42.99
HIDDEN OBSESSIONS Movie $27.99
NEW WAVE H+K+R1, 2 Movie $27.99
BABY'S GOT B**T Movie $27.99
TRACI, I LOVE YOU Movie $27.99
ADULT PALATE 2 Photos $27.99
AMERICAN GIRLS 1, 2 Photos $27.99
ASIAN PALATE Photos $27.99
HOT PEPPERS Photos $19.99

OVER 100 TITLES AVAILABLE!
MUST BE 21 TO ORDER
800-643-4205
(818) 785-0995 • FAX (818) 785-7018
5818 Van Nuys Blvd., Van Nuys, CA 91401

CIRCLE 566 ON READER SERVICE CARD

CD-ROM THE LATEST & JUICIEST RELEASES!
LOWEST PRICES — PHONE ORDER: 1-800-536-9292 FAX: 1-702-736-5655 — LARGEST SELECTION

INTERACTIVES
- CD 100 DIRTY TALK (PC) A INDIVIDUAL SEXUAL PERFORMANCES 145.99
- CD 101 DOORS OF PASSION (PC) EXPLORE THE DOORS OF PASSION MANSION 165.99
- CD2012 THE DREAM MACHINE* (PC/MAC) 3-D ADVENTURE, ADAPTS TO YOUR PARTNER 169.99
- CD2002 ADV. OF SEYMORE BUTTS (PC/MAC) FOLLOW SEYMORE & HIS LOUCHE TIME CAMERA 169.99
- CD7002 NIGHTWATCH (PC/MAC) SEXY SECURITY GUARD MAKES THE ROUNDS 169.99
- CD2100 VIRTUAL VIXENS (PC/MAC) STAR SEARCH OF THE FILM CENTRAL 169.99
- CDV15 LEGEND OF KUMA SUTRA (PC) SEX MANUAL BY CYBER PORNOGRAPHY 169.99
- CDV13 101 SEX POSITIONS PT 1 (PC) PROFESSIONAL ADULT EDUCATION 149.99
- CDV14 101 SEX POSITIONS PT 2 (PC) MORE DANCE & STARS OF THE ART TECHNOLOGY 149.99
- CDV24 BLONDE JUSTICE (PC) BEHIND THE SCENES OF A STRIP CLUB 129.99
- CDV16 MYSTIQUE OF THE ORIENT (PC/MAC) EPOXIE IT THE FIRST ERA 139.99
- SPS100 WILD INNOCENCE (PC/MAC) THE TITLE SAYS IT ALL 160.99
- SPS200 THE LAST GIRLSCOUT (PC/MAC) CHECK THE SEE COOKIES OUT 160.99
- CCD100 ADV. OF CHESSIE MOORE (PC) BRINGS YOUR BEHIND TO THE WORD "ADVENTURE" 162.99
- SIL686 ORIENT EXPRESS (PC) COME RIDE THE ORIENT EXPRESS 160.99

PHOTO DISCS
- CD102 EXTREME DELIGHTS (PC) WOMEN & MEN GET EXTREME & SEXY 169.99
- CD999 VISUAL FANTASIES (PC) MEET WE SAY MORE!! 169.99
- CDI 9003 ADULT PALATE II (PC/MAC) TO DURE YOUR INNERMOST CRAVING 139.99

SPECIAL! OVERSEAS RELEASE!
- IL100 P.X.RANMANIA (PC) 2 CD PACK-100 GOOD TO MISS! 1118.95

CLASSIC MOVIES
- CD7001 HIDDEN OBSESSIONS (PC/MAC) PENTHOUSE PET JANINE LINDEMULDER 169.95
- CD1002 NEW WAVE H,X,KERS (PC/MAC) CLASSIC SERIES STARRING CINDER LYNN 149.95
- CD1004 TRACI I LOVE YOU (PC/MAC) IN ENCYCLOPEDIA OF THE LONG LEGS 149.95
- CD1005 INSATIABLE (PC/MAC) EXCITING SEXPERIMENTS IN BEDROOM CHAMBERS 149.95
- CD1006 CAFE FLESH (PC/MAC) SERVED UP HOT & FULL LENGTH 149.95
- CD1101 DEBBIE DOES DALLAS (PC) DEBBIE & HER FRIENDS WILL DO ANYTHING 129.99
- CD 107 DUNGEON OF D (PC) MEET MISTRESS JACQUELINE & FRIENDS 169.99
- CDV27 THE MASK (PC) A STORY OF ONE'S INDIVIDUAL WORTH 139.99
- CDV26 IMMORTAL DESIRES (PC) SOME THINGS NEVER DIE 139.99

AMX • CASH • CHECK • M.O. • VISA • MC
NEXT DAY DELIVERY $8.00 • 2 DAY DELIVERY $4.00
UPS DELIVERY $4.00
U.S. CURRENCY ONLY ARE REGISTERED $2.00
FOREIGN ORDER *100 MINIMUM

Free 84 PAGE COLOR MAGAZINE WITH EVERY ORDER.
Actec Internal Double Speed CD-Rom Drive FOR PC & COMPATIBLE $CDR 101 = *169.95

PLEASE SPECIFY ✆PC OR ✆MAC — MUST BE 21 OR ORDER

TM PUBLISHING
2609 S. HIGHLAND DEPT PCC994
LAS VEGAS, NV 89109

CIRCLE 567 ON READER SERVICE CARD

GAY MODEM
FREE ACCESS

Unlimited Chat & Downloads
Gay Owned & Operated
Original Gay GIFs
Chat with Guys
Leather Shopping Mall
Matchmaker
Video Reviews
Video Stars...Donnie Russo, etc.
70 lines up to 16.8k

1-217-792-3671
Use your Modem to Dial
Customer Support Voice Line 415-981-3154

CIRCLE 564 ON READER SERVICE CARD

HOT ADULT CD-ROM's
Multiple Films, Each Title!

CD SUPER-SAVER BUNDLES!
ANY 2 TITLES FOR $79
ANY 3 TITLES FOR $99
ANY 4 TITLES FOR $119

- Maddams Family
- Immortal Desire
- Blonde Justice
- Sex
- A'alVision
- Bustin' Out
- The Beaverly Hillbillies
- Mystique Of The Orient
- The Best Of Hot Shorts

"MUST SEE"

● MAC/PC ● PC ONLY

Quality, Interactive Motion Pictures, Gorgeous Actresses!

Call: 800 6161CMS
Fax: 805 495-3644
BBS: 805 373-2965
CD ROM Multimedia & Specialties

CIRCLE 571 ON READER SERVICE CARD

FREENET BBS
215-445-1111
FREE FREE FREE FREE FREE

Lively Chat • Gif's Galore
Internet Mail • News Groups
1000's of DOS & Windows Files
Service is FREE You Pay L.D. Charge

FREE FREE FREE FREE FREE
Full Access 14.4K B/N/1 Modes
Service is FREE You Pay L.D. Charge

217-322-1111
INTERNET ACCESS

CIRCLE 565 ON READER SERVICE CARD

PENTHOUSE O·N·L·I·N·E
THE BEST OF PENTHOUSE AND MORE!

- Sizzling GIFs of Pets, Lovesets and More!
- Hot Message Boards and Live Chat
- Fast "Photo Preview"
- Highest Quality Files
- 14.4/VGA
- Penthouse, Forum and Variations Letters
- "Photo Email"
- Local call from most areas
- Affordable Rates

For modem signup call
1-619-546-2364 (8-N-1)
Info: 1-619-546-2360
21 or older only

HUSTLER Online
The Best Reason Yet To Own A Modem

Introducing the premium adult bulletin board service. Hustler Online is an electronic library of Hustler Magazine's vast archives including material that was never published.

Hustler Online is extremely easy to use. In fact, you already know how to use it because we use the same interface you're used to whether it is Windows or Macintosh.

Our state of the art system is continuously updated with the highest quality, most provocative images you've ever seen on your computer. And to ensure that you only get the images you want, we've incorporated lightning fast 256 color previews.

To sign up simply set your communications software to 8-N-1 and call:

(816) 472-4648

Or call (816) 472-4646 for a free color brochure

Modem is not included. Must be over 18 years of age. Copyright 1993 Hustler is a registered trademark of Flynt Distribution Co.

CIRCLE 569 ON READER SERVICE CARD

Unleash the power of your modem

The Exchange®
Bulletin Board System
The only dirtiest BBS you'll ever need
Thousands of Free Programs

- Windows
- DOS
- OS2
- Word Processing
- Dotobase
- Games
- Adult Photos (Gifs)
- Animated Adult Movies
- E-Mail
- Live Chat & More
- New offering Internet access
- Local Access from over 600 Cities

Great for beginners & advanced users of all ages

We're only a phone call away!
Modem: 516/579-5550
Supporting up to 14.4 Kbs, N-8-1 Full Duplex

CIRCLE 570 ON READER SERVICE CARD

ROMTECH
Exclusive manufacturer of adult CD's. Excellent selection. New titles each week.

Dealer inquiries welcome US and International

800-900-0526

VISA MasterCard

MUST BE 21 OR OLDER

New York's Best BBS
Since 1984
The Invention Factory
Online Software & E-mail Exchange

Free software for new users!
More than 14 Gigabytes of Shareware & Freeware files.
48 USR 16.8 v.32/bis modems.
INTERNET/Usenet E-Mail.
Thousands of game programs.
Over 3000 online conferences.
Very large and well organized *Adult Files Section.*

To browse the system and register online by modem call:

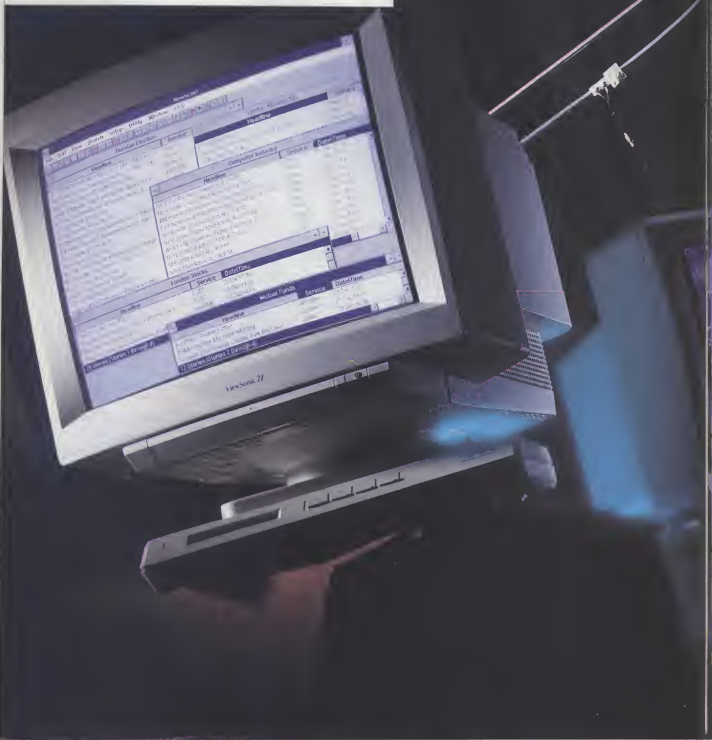
212-274-8110
Amex, Master & Visa

CIRCLE 575 ON READER SERVICE CARD

Technolust

It Was a Dark and Stormy Night–

Don't need a weatherman to know which way the wind blows. The info deluge is pouring all around us. Don't get swept away in the flood. Siphon off what you need with this array of info-channeling PC hardware and software.



PHOTOGRAPH BY GEOFFREY NILSSON

All the News That Fits: Pick an infosource—Dow Jones, AP, CNN, whatever. Newscast for Windows' FM receiver (left) taps them all and sends out the facts via VIM or MAPI mail.

Newscast for Windows / Mainstream Data / (800) 299-2278 / $495 receiver, $995 software; subscription costs vary
Circle Reader Service No. 692

It's on TV: Fill your disk with stock reports, news updates, and more by installing the Closed Caption Decoder board in your PC. Then plug WeatherBrief hardware into your parallel port for a meteorological fix (center PC).

Closed Caption Decoder / International Computers / (800) 992-9000 / $89
Circle Reader Service No. 692

WeatherBrief Plus / WeatherBank / (800) 201-4585 / $295
Circle Reader Service No. 693

Monitor the Facts: Crunch data and graphics faster with Intergraph's CAD-blasting TD-3 90MHz Pentium (center). And use a big-screen SVGA ViewSonic monitor to view them.

TD-3 Personal Work Station / Intergraph Corp. / (800) 345-4856 / $7,300
Circle Reader Service Number 694

ViewSonic 17 and 21 / ViewSonic Corp./ (800) 888-8583 / $1,045 and $1,995
Circle Reader Service Number 695

This Keyboard Speaks! With the CompuPhone keyboard, just plug in a headset—such as the Plantronics' Mirage—and you have a zero-footprint phone (right). Dial out from the keypad or with its software.

Mirage / Plantronics / (800) 544-4660 / $88
Circle Reader Service No. 696

CompuPhone / Integrated Technology / (800) 393-8889 / $159
Circle Reader Service No. 697

BY MATTHEW J. LAKE

The Quickest Way for the CD-ROM Revolution to Pick up Speed.

Introducing the 4PleX Quad Speed CD-ROM Drive with a 1MB Buffer.

If you've been waiting for CD-ROM drive performance to really take off, get ready to hold on tight. The new Plextor 4PleX leaps past the capabilities of 2X and 3X drives, and puts you in the forefront of the multimedia revolution. The fastest (600KB/sec) data transfer rate yet seen will whiz multimedia video, graphics and animation across your screen, providing you with realism and excitement that slower CD-ROM drives can't match.

4PleX quad speed drives are available in both internal (standard half-height size for easy mounting in your PC) and external configurations. Both models feature a massive 1MB buffer, the largest ever found on a CD-ROM drive. They connect to your system through a SCSI-2 interface, which offers tremendous performance advantages over the IDE- and ATAPI-interfaces used by many competing drives. 4PleX drives surpass MPC-2 specifications, and are XA and Kodak Photo CD multisession compatible.

Plextor drives are designed for maximum performance and minimum downtime. They are built at an ISO 9002-approved factory in Japan, boast an industry-leading 70,000 MTBF (15% duty), and are covered by a two-year warranty. If you encounter any difficulty installing or operating a 4PleX drive, call our toll-free technical support line, where real people with real answers (CD-ROM is all they do!) will assist you.

Why wait? Join the multimedia revolution with a revolutionary 4PleX CD-ROM drive. Call toll-free 800-4PLEXTOR (800-475-3986) for more information and the name of a dealer near you.

Ask for a free copy of our brochure, "15 Questions To Ask Before Purchasing A CD-ROM Drive"

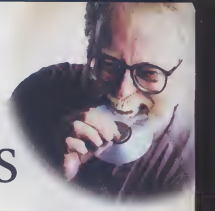
PLEXTOR

4255 Burton Drive
Santa Clara, CA 95054
Tel: 408-980-1838 or
Tel: 800-4PLEXTOR
Fax: 408-986-1010

©1994 Plextor Corp. All Rights Reserved. 4PleX is a registered trademark of Plextor Corp. All other trademarks or registered trademarks listed specified are owned by their respective holders.

Circle 158 on reader service card.

CD-RONWhite



Round Magazines

Either you like magazines and hot new technology, or you're reading this column to torture yourself. High-tech–magazine lovers take note: You'll have plenty of opportunities to indulge yourselves with some of the new CD-ROM–based magazines we spun this month. If only you could read them on the plane.

This Is CompuServe: Made you look! Check out CIS on CD every month.

COMPUSERVECD ●●●●

CompuServe is good for a lot of things: finding quick answers, chatting with people you'd never meet in person, and downloading shareware. But the service is not good to look at, and it's poor territory for multimedia—until now, that is. CompuServeCD is a monthly disc that does offline all those things that CompuServe doesn't do well online.

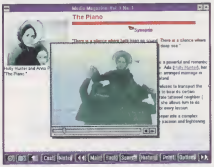
The CD is like a monthly magazine with its own departments: home and leisure, entertainment, shopping, software tips, and so on. It's much of the same information you can get online, except that just about everything has Windows sound, photos, or video attached to it—from a track off Jimmy Buffet's new album to a catalog for ordering flowers. The best feature, however, is that you can use CompuServe's File Finder offline to select files for downloading, then have the CD call CompuServe to get the files you want.

The disc also comes with the latest version of CompuServe Information Manager for Windows (WinCIM) to access CompuServe through Windows, plus five bucks of connect time. If you're a CompuServe member, it's a no-brainer.

CompuServeCD / CompuServe / (800) 848-8199 / $7.95 per issue, including $5 usage credit
Circle No. 700 on Reader Service Card

MEDIO MAGAZINE ●●

Here's another online magazine. Unlike CompuServeCD, Medio Magazine is mainly text, and mainly from the Associated Press newswire. The stories are plentiful, varied (from Kurt Cobain to Botticelli), and often accompanied by still photos. But the only place I found extensive multimedia was in promotional videos for current movies. And none of the textual information has the immediacy of CompuServe. For example, stock and mutual-fund listings are available, so you can select the ones you own and graph them. But the June premiere disc didn't go beyond April's prices, which isn't going to give an investing advantage on anyone without the benefit of a time machine.



Read My Clips: Medio's movie reviews pack more trailers than HBO.

OK, this was the magazine's first issue. The first issue of *PC Computing* looked pretty strange, too. We hope Medio will sacrifice some breadth for more attitude and a better use of the CD-ROM medium.

Medio Magazine / Medio Multimedia / (800) 788-3866 / $9.95 per issue, $59.95 per year
Circle No. 701 on Reader Service Card

GOVERNMENT SPENDING ●●●

Oh great, I thought, when I got Government Spending in the mail, more statistics for old men to complain about at family gatherings. But no, it's just the opposite. This is a CD for enterprising executives who want the feds to spend even more—in their direction.

A searchable database of all federal government contracts, Government Spending lets you find out just what your competitors are doing for the government, when their contracts come up for renewal, and exactly how much agencies are paying to whom. The CD is DOS based, and I've seen friendlier interfaces on a ticked-off gorilla. But the concentration required to devise complex searches is rewarded by the depth of material you can access quickly from the more than 425,000 records on the disc.

I can think of at least half a dozen old codgers I'm giving it to. Maybe they'll shut up if they get a first-class ticket to ride the gravy train, too.

Government Spending / CD Publishing / (800) 460-2371 / $99.95, $250 per year for quarterly updates
Circle No. 702 on Reader Service Card

●●●●● *The time of your life.* ●●●● *The time of someone else's life.* ●●● *The time of day.* ●● *More fun than timing an egg.* ● *Like waiting for the water to boil.*

PHOTOGRAPH BY JAMES McGOON

What a Century! See the last 94 years through the eyes of *Time* magazine.

TIME ALMANAC OF THE 20TH CENTURY ○○○○

Ever doubted that this is one of the most exciting centuries in history? If so, get Time Almanac of the 20th Century. Through sound clips, video, photography, and text, this Windows program covers the aging century in a mixture of politics, war, technology, and people. Getting to the presentations and media clips from various approaches lets you amble through the century wherever your interests take you. The CD includes a game called News-Quest that looks like some dork educator's idea of how to trick pupils into learning history. It's nowhere near as interesting as the rest of the disc—or the last 90 years.

Time Almanac of the 20th Century / Compact Publishing / (800) 964-1518 / $69.95
Circle No. 703 on Reader Service Card

NATIONAL GEOGRAPHIC CD-ROM PICTURE ATLAS OF THE WORLD ○○

Whoa, it's raining magazine spin-offs this month. Here's an atlas on CD from the venerable master of foreign-land photography, *National Geographic*. But it didn't really know how to dress for the party. The disc is DOS-only—a little stodgy and uncomfortable in the company of flashier Windows multimedia. Even its maps—the other thing that *National Geographic* is well known for—look crude, and the interface for moving through the levels of information they contain is creaky. The photography and video clips are as great as you'd expect, but this photo album needs a new cover.

National Geographic CD-ROM Picture Atlas of the World / National Geographic Society / (800) 368-2728 / $89
Circle No. 704 on Reader Service Card

USA WARS: WORLD WAR II ○○

Want to play a really dumb-looking game? Forget the one in the Time Almanac. Head straight for USA Wars: World War II. This DOS and Windows game has a strained premise: Pick a game-show team from the Axis (Hitler, Mussolini, Rommel, and their cronies) and one from the Allies (Churchill, Roosevelt, Patton, and other guys in white hats).

The disc also has strained artistic skills: Its crude animations make all the major figures of the largest armed conflict of this century look like Beavis and Butt-head. As for the rest of the CD, a little multimedia, a lot of text, and a gallery of clumsily presented still photos go a long way—the further, the better. The copious photographs—which don't exclude the grim realities—are the best selling point for war buffs.

USA Wars: World War II / Compton's NewMedia / (800) 882-2208 / $39.95
Circle No. 705 on Reader Service Card

THE PRINT SHOP DELUXE CD ENSEMBLE ○○○

Broderbund has thrown its entire set of cult-success desktop publishing utilities onto a single disc, The Print Shop Deluxe CD Ensemble. These are not corporate presentation tools, but for the kids, home use, quick-and-dirty business cards, and that all-important Happy Labor Day card for grandma, there's nothing better around. The CD version brings together all of Print Shop's easy-to-use Windows programs, its vast collection of borders, clip art, and initial caps, and a utility (which, strangely enough, is DOS) for converting graphic formats. If you've liked any part of the original Print Shop programs, you'll love this ensemble.

The Print Shop Deluxe CD Ensemble / Broderbund Software / (800) 521-6263 / $80 (estimated street price)
Circle No. 706 on Reader Service Card

WRATH OF THE GODS ○○

Wrath of the Gods sounds like a sure bet—40 hours of video-laden role-playing in the classic myths. Stories based on ancient Greek mythology have been big box-office for centuries. This can't fail, right? Wrong. And it fails for the same reasons it sounds so intriguing. The game's video and high-resolution still photos are stiffer and more awkward than traditional game animation. When characters speak, for example, their bodies are still while only their mouths or heads move—just like the cheapest Hanna-Barbera cartoons. All in all, Wrath of the Gods illustrates the biggest myth in multimedia these days, that video clips automatically improve any software.

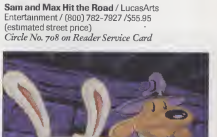
Wrath of the Gods / Luminaria / (415) 821-0536 / $59.95
Circle No. 707 on Reader Service Card

SAM AND MAX HIT THE ROAD ○○○○

One of the most sophisticated adult CD games features a dog in a cheap suit and a wisecracking rabbit with a reckless disregard for life—others' lives anyway. They're Sam and Max, freelance police—a couple o' mugs stuck in a tongue-in-cheek film noir cartoon that rings of sixties underground comics.

The cartoon detectives are hot on the trail of a carnival's bigfoot. Your mission: guide them, solve visual riddles, ask the right questions, pick up objects to use later, and find a place for Sam to go to the bathroom. On the way, play games within the game. Unlike most other game characters, Sam and Max deliver a witty script in a perfect deadpan. It's like *Naked Gun 33 ⅓* on disc. I'm a sucker for it.

Sam and Max Hit the Road / LucasArts Entertainment / (800) 782-7927 / $55.95 (estimated street price)
Circle No. 708 on Reader Service Card



Not for Kids: Sam and Max are a mix of R. Crumb and Dashiell Hammett.

PC Computing (ISSN 0899-1847) is published monthly by Ziff-Davis Publishing Company, a division of Ziff Communications Company, One Park Ave., New York, NY 10016. Second-class postage paid at New York, NY 10016 and at additional mailing offices. Postmaster: Send address changes to PC Computing, P.O. Box 58229, Boulder, CO 80322-8229. Printed in the U.S.A.Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 239513, The Canadian GST registration number is R123669673.

The New Sound Blaster AWE32.™

Sound BLASTER

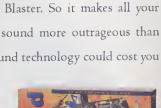
Introducing the wave of the future: the new Sound Blaster AWE32. It combines advanced wave table synthesis, a powerful digital signal processor, and the hottest audio effects all on the same sound card. That's why it's the next generation PC sound standard.

The Sound Blaster AWE32 puts the world's purest music synthesis technology (from E-mu Systems) inside your PC. It also includes effects like chorus and reverb for increased depth and richness. And QSound so you can position sounds in 3D. It even comes with downloadable SoundFont™ technology, so you can add to the library of sampled sound effects and instruments. And the latest speech technology, so you can navigate through all the major Windows™ applications using voice commands.

Of course, it's a Sound Blaster. So it makes all your favorite games and software sound more outrageous than you ever imagined. All this sound technology could cost you thousands. But the new Sound Blaster AWE32 is only $399.* No other sound card comes close. Sound interesting? Visit your local Creative Labs dealer. Or call 1-800-998-5227.

SOUND BLASTER AWE32 INCLUDES:

SOUND BLASTER AWE32 TRUE 16-BIT CD SOUND ADVANCED WAVEFFECTS™ SYNTHESIS 32-VOICE POLYPHONY SAMPLING SUBSYSTEM	GENERAL MIDI INTERFACE THREE CD-ROM INTERFACES MICROPHONE SOFTWARE INCLUDES: CARTWALK APPRENTICE FOR WINDOWS	HSC INTERACTIVE SE CREATIVE WAVESTUDIO™ 2.0 QSOUND CONTROL PANEL CREATIVE ENSEMBLE™ CREATIVE SOUNDOLE™ CREATIVE MOSAIC



CREATIVE
CREATIVE LABS, INC.

WAKE UP THE REST OF YOUR BRAIN.™

*Suggested retail price. ©1994 Creative Technology Ltd. Sound Blaster, Sound Blaster AWE32, Advanced WavEffects, Creative VoiceAssist, Creative TextAssist, Creative Ensemble, Creative WaveStudio, Creative SoundFX and the Sound Blaster and Creative logos are trademarks of Creative Technology Ltd. All other trademarks are the property of their respective owners.
U.S. inquiries: Creative Labs 1-800-998-5227 or 408-428-6600. International inquiries: Creative Technology Ltd., Singapore. TEL 65-773-0233 FAX 65-773-0353.

Circle 133 on reader service card.

PennJillette

alt.fan.gutenberg

Twenty-three million people are hooked up to the Net and ten million were first online in the past year. (What are the odds of those two exact, neat, even, eight-digit numbers showing up in one factoid? It's amazing, like one in a million or something.) That means between the time this column was due and the time my editor got it on her hot little disk, 27,397 humans went cyber—Criminy! The barbarians have typed their way through the gates and they're throwing netiquette out the window. (How pompous can you afford to be after you've come up with ":)" *and* "netiquette"?)

Netiquette, schmetiquette (you'll want to read that aloud—it's more fun than you might think). If a newsgroup can't ridicule neophytes into playing by the unwritten rules, it doesn't take much to delete-without-reading inappropriate dilettante flames. It wastes time and it's way irritating, but it's better than running to daddy. We can't afford to give the government another electronic inch.

We need as much peaceful anarchy as we can keep. We can suffer bores, but we mustn't tolerate cops limiting or invading what we send and receive on the Net. I'm all for the Thin Blue Line between us and murderers, rapists, muggers, and thieves, but we can't have the nosy, control-freak, bureaucrat "cops" walking that unconstitutional and immoral communications beat.

History shows that when only the elite have something, the government doesn't give a good goddamn. There's been pornography and dangerous politics floating around the uppercrust since there was crust, with next to no censorship. Why bother? Censorship was Gutenberg's toxic by-product.

As soon as the press was up and running, fascist-wannabes were writing laws to control what was printed on it. The government didn't bother with unpleasant, nutty, fringe stuff when it was handwritten. If I had to scribe out all 903,102 (what are the chances of that number being on a random back page? Almost one in a million!) copies of each *PC Computing* column by hand, I might not think it was worth writing "goddamn" over and over just to enjoy a handful of goofy, angry letters.

Nosy, bureaucratic **FASCIST-WANNABES . . .**

CENSORSHIP *is Gutenberg's toxic by-product . . .*

The answer to evil speech is **MORE SPEECH.**

I hate longhand—call me arrogant—but I think it wouldn't take me *that* long to invent an "Uma Thurman" stamp. (I would never think of movable type though—never—I know my limitations.) Gutenberg gave books to the masses and government is about messing with the masses.

The powers that be are usually pretty cool with fancy modern dancers hopping around nude, but when men and women start dancing naked for the "No cover, no minimum, no buck knives, no colors" majority, the government is ready to protect us from what some of us are enjoying.

What I didn't realize before reading this great paper, "New Technology and the First Amendment—Breaking the Cycle of Repression," by Robert Corn-Revere, was that, as Robert says, "By adopting the First Amendment, the United States became the first nation to embrace the new technology as an essential component of its political system."

Our revolutionaries weren't just rebelling against the suppression that they had experienced, they were rejoicing in letting this *new technology* (maybe over 300 years old doesn't seem new to you, but this was before MTV—things went slower) be *part* of democracy. We must not get so excited about all the cool bells and whistles on our new technology that we forget that, at the end of the day, it's just communication and that's what our founding brain trust meant by "speech."

The Net is wild and free. It's a zillion personal and anonymous conversations going on all at once, unfettered by time or space. Yup, it can be disgusting, unpleasant, and just plain straight-ahead wrong, but that shouldn't be stopped. Justice Brandeis was right when he said the answer to "evil" speech is "more speech." (In 1928 he tried to nip the Clipper, voting against wiretapping.)

They caught us napping and we lost the battle for freedom on radio, movies, TV, and cable—we can't afford to lose it on the Net just because it's no longer elite.

PHOTOGRAPHY BY JAMES McGOON. ILLUSTRATION BY GERALD FRAMPTON. PHOTO OF FIGURE BY LAURA SALMON.

BETTER FEATURES.

BETTER PRICE.

BETTER CHECK IT OUT.

THE NEW DELL LATITUDE 8 HOUR BATTERY LIFE ONLY $2098

INCLUDES $99 OPTIONAL SECOND BATTERY.

New Dell® Latitude™ 33MHz SX

$1999

Business Lease: $74/Mo.

- 4MB RAM
- 200MB Hard Drive
- 9.5" Dual Scan STN Color Display

Order Code #600009

intel inside

New Dell Latitude 50MHz DX2™

$2499

Business Lease: $93/MO.

- 4MB RAM
- 340MB Hard Drive
- 9.5" Dual Scan STN Color Display

Order Code #600010

COMMON FEATURES

Speed & Graphics

- DX/2 and SX SL-enhanced Processors
- 32-bit Local Bus Video/1MB VRAM

Flexibility & Modularity

- 1 Type III/2 Type II PCMCIA Slots
- Removable 3.5" Floppy Replaceable with Second Battery
- 8+ Hours of Battery Life with Two Batteries (Extra battery $99)

Ready-To-Run

- MS-DOS 6.2/Windows 3.1
- CommWorks
- America OnLine/RadioMail

DELL™

To Order, Call

800-433-6654

In Canada, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #11XCW

g floppy drive with a second NiMH battery. Independent battery life test performed by VeriTest. Testing included both Steeplechase and Sprint testing. For a complete copy of the VeriTest report, please call 1-800-BUY-DELL.
r Satisfaction Study conducted among 1,956 business user respondents. ⁹Business leasing arranged by Leasing Group, Inc. *Prices valid in the U.S. only. Some products and promotions may not be available outside the
. The Intel Inside and Pentium Processor logos, Pentium, DX2 and SX2 are trademarks of Intel Corporation. Peavey is a registered trademark of Peavey Electronics Corporation. MS-DOS and Microsoft are a registered
on. Fortune 500 is a registered trademark of the Time Inc. Magazine Company. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

AS USUAL, THE LOWEST PRICES ARE IN THE BACK OF THE MAGAZINE.

90MHz PENTIUM MINI TOWER

Dell Dimension XPS P90 Mini Tower

A Pentium Based 90MHz System

- Mini Tower Chassis
- 16MB RAM
- 1GB Enhanced IDE Hard Drive (10ms)
- VS17 Monitor (17" CRT, NI)
- 64-Bit I/O PCI 2MB VRAM Video Card
- NEC 3X CD ROM Drive (450KB/Sec. Transfer Rate)
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$3899

Business Lease: $140/Mo.

Order Code #500026

90MHz PENTIUM BEST BUY

Dell Dimension XPS P90 Mini Tower

A Pentium Based 90MHz System

- Mini Tower Chassis
- 8MB RAM
- 1GB Enhanced IDE Hard Drive (10ms)
- VS15 Monitor (15" CRT, NI)
- 64-Bit I/O PCI 2MB VRAM Video Card
- 2X Multi-session CD ROM Drive
- 256KB External Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2999

Business Lease:$111/MO.

Order Code #500025

LOADED P60

Dell Dimension XPS P60

A Pentium Based 60MHz System

- 8MB RAM
- 528MB Hard Drive (12ms)
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB VRAM
- 2X Multi-session CD ROM Drive
- Soundblaster 16 Sound Card
- Peavey® 240 Bi-Amplified 2-Way Speakers
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2499

Business Lease:$92/MO.

Order Code #500029

MULTIMEDIA/MS OFFICE

Dell Dimension 466V Intel® DX2 66MHz System

- 8MB RAM
- 528MB Hard Drive (12ms)
- VS15 Monitor (15" CRT, NI)
- Accelerated Local Bus Video
- 2X Multi-session CD ROM Drive
- Soundblaster 16 Sound Card
- Peavey 200 Speakers
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS Office, Bookshelf, Quicken
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$2199

Business Lease:$81/MO.

Order Code #300030

60MHz PENTIUM UNDER $2000

Dell Dimension XPS P60

A Pentium Based 60MHz System

- 8MB RAM
- 340MB Hard Drive (13ms)
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB Video RAM
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Pictured system

$1999

Business Lease:$74/MO.

Order Code #500023

66DX2 PROCESSOR

Dell Dimension 466V Intel DX2 66MHz System

- 8MB RAM
- 340MB Hard Drive (13ms)
- VS15 Monitor (15" CRT, NI)
- Accelerated Local Bus Video
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$1599

Business Lease:$59/MO.

Order Code #300019

33SX PROCESSOR

Dell Dimension 433SV Intel SX 33MHz System

- 4MB RAM
- 340MB Hard Drive (13ms)
- VGA 800 Monitor (14" CRT)
- Accelerated Local Bus Video
- One Diskette Drive (3.5")
- Spacesaver Keyboard
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

$1099

Business Lease:$41/MO.

Order Code #300038

CUSTOMER SATISFACTION #1 J.D. POWER AND ASSOCIATES PC USERS 1993 SM

Ranked highest in the 1993 J.D. Power and Associates Desktop PC Customer Satisfaction Study among business users.†

DELL™

To Order, Call

800-433-6658

In Canada*, Call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #1IXCX

*Latitude is powered by NiMH battery with an option of replac

†1993 J.D. Power and Associates Desktop Personal Compu

U.S. Prices and specifications subject to change without no

trademark and Windows is a trademark of Microsoft Corpora

IT'S A SMALL PRICE TO PAY FOR POWER.

90MHz PENTIUM
2X CD ROM AND PCI LOCAL BUS VIDEO
ONLY $2599

INSIDE YOU'LL FIND EVEN MORE EVERYDAY LOW PRICES.

Dell Dimension™ XPS P90 Mini Tower
A Pentium™ Based 90MHz System

$2599

Business Lease*: $109/MO.

SYSTEM SPECS:

- Mini Tower Chassis
- 8MB RAM
- 540MB Hard Drive
- VS15 Monitor (15" CRT, NI)
- PCI Video Card With 1MB VRAM
- 2X Multi-session CD ROM Drive
- 256KB Writeback Cache
- One Diskette Drive (3.5")
- SpaceSaver Keyboard
- MS-DOS® 6.2/Microsoft® Windows™ 3.1/Mouse

Order Code #500024

DELL SPECS: Besides everyday low prices on PCs, Dell gives you the support of a FORTUNE 500® company with nearly $3 billion in annual sales. In fact, since our birth ten years ago, we've become one of the top five PC companies worldwide.

intel inside pentium PROCESSOR

DELL™

To Order, Call
800-433-5901
In Canada, Call 800-668-3021
Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT

Keycode #11XJ4